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The SIGNALMAN'S Journal

BROTHERHOOD OF RAILROAD SIGNALMEN
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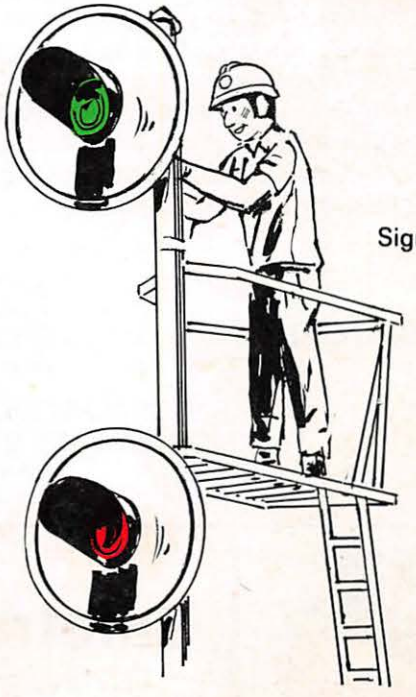
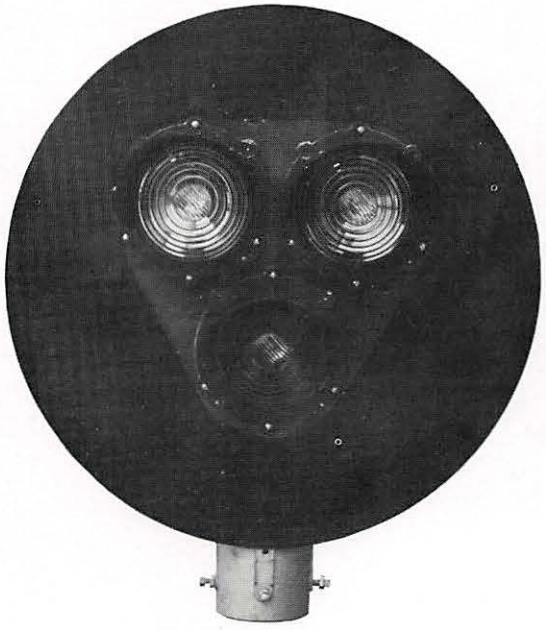
Part 2 of a Special Report on the Federal Railroad Administration's Safety Inquiry on Signal & Train Control Systems begins on page 9. Cover photograph courtesy of Santa Fe Railway.

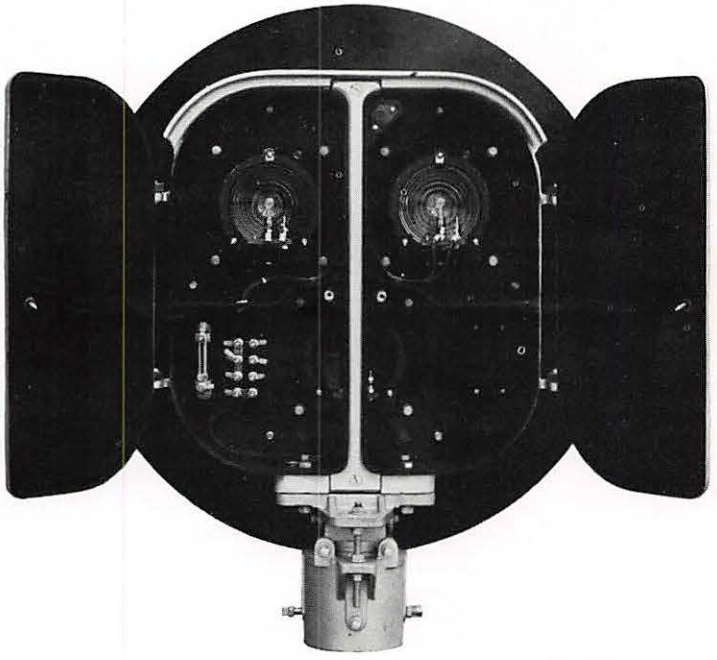


Signalman Sam

MAY 1979

TYPE V COLOR LIGHT SIGNAL





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GOLF CAPS with BofRS in color are available in small, medium or large with adjustable head band. These lightweight net caps come in red, black or white.

The eight-volume **SIGNALMAN'S TRAINING COURSE** covers the following subjects:

1. Electricity, circuit symbols and nomenclature
2. Signal symbols and nomenclature
3. Automatic block signaling, time code control, electronics
4. Traffic control systems and power switch machines
5. Highway grade crossing warning systems, FRA RS&I tests
6. Remote control and automatic interlockings
7. Ctc machines and their operation
8. Maintenance of signal equipment

SIGNALMEN'S DECAL has adhesive backing so it can be applied to glass, leather, metal, etc. for BofRS identification on car windows, bumpers, luggage, hard hats, etc. The emblem is 4-inches or 3-inches in diameter. It has a red border with white letters. The signal displays green over red.

Metal **COLORLIGHT SIGNAL LAPEL PIN** 1/2-inch in diameter with signal showing green over yellow over red on white enamel background. Signal and pin outlined in gold.

BofRS **LAPEL PIN** identical to decal except letters and outline are in gold.

Red nylon **WINDBREAKERS** with elastic sleeve ends that fit tight to the wrists and with a drawstring at the bottom to pull tight to the waist come in three sizes: small (36-38); medium (40-42); and large (44-46). Two slash pockets and a cloth BofRS patch on the left front complete these men's jackets. The windbreaker is machine or hand washable in warm water.

A **HISTORY OF THE BROTHERHOOD OF RAILROAD SIGNALMEN** has been written by the late A. E. Lyon, president emeritus, which covers the 75 years of the Brotherhood since its founding in 1901.

MASTER NATIONAL AGREEMENT BOOK has the basic provisions of national agreements negotiated with U.S. railroads and the BofRS. They are contained in a loose-leaf binder with 2-inch rings so there is room for additional material, such as local agreements. The 23 sections are:

A Summary of wage changes
B Summary of other benefits
C Washington job protection agreement of 1936
D Vacations
E Union shop agreement
F Holidays
G Claim and grievance handling
H Health and welfare
I Force reductions
J Employment security
K Travel time and away-from-home expenses
L Off-track vehicle accidents
M Jury duty
Mc Current agreement
N Overtime
O Camp cars
P Apprentice programs
Q Change of residence
R Earnings deduction in discipline cases
S Supplemental sickness benefits
T Union dues checkoff
U Amtrak C-1, C-2
V Seniority modification agreement

News Briefs

Ole M. Berge, president, Brotherhood of Maintenance of Way Employes, stops to chat with W. D. Best (right) secretary-treasurer, Brotherhood of Railroad Signalmen, at the recent union industries show in Denver, CO. Best is in front of a rail-highway grade crossing warning system instrument case that was part of the Signalmen's and Safetran Systems Corp. display that showed the public how flashing-light signals operate.

Railroad retirement annuities, as well as social security beneficiaries, will receive cost-of-living increases in their monthly benefits beginning with their July 1 checks.

The Tier I portion of all employee and spouse railroad retirement annuities and both Tier I and Tier II portions of survivor annuities will be increased by 9.9%, the same as for social security benefits. *However, if an annuitant also receives a social security benefit, his social security cost-of-living increase is subtracted from the railroad retirement Tier I increase.*

Employees and spouses will also receive 3.2% increases in their Tier II benefits which are not available under social security. Furthermore, these increases are not reduced because of the beneficiary's entitlement to social security benefits.

Increases not paid on July 1 will be paid retroactively at the earliest possible date thereafter.

Also, the monthly Medicare premiums will be increased for both railroad retirement and social security beneficiaires. The basic Medicare premium increases July 1 by 50¢ raising the premium from $8.20 to $8.70.

Consolidated Rail Corp. has begun construction to convert its Oak Island, NJ yard near Newark. The $19.1 million project includes modern controls and new retarders to handle 160-ton cars. The 30 classification tracks will be regraded to improve control of cars being humped. Completion is scheduled for next year.

Baltimore & Ohio has applied to the Federal Railroad Administration for approval to install a traffic control system replacing automatic block signaling on 182 miles of line between Oakley and Belpre, OH. This is essentially the entire line from Cincinnati, OH east to Parkersburg, WV.

Burlington Northern will install 130 miles of centralized traffic control this year between Ravenna and Seneca, NE. Also, work will begin on 125 miles of ctc between the Gillette-Orin line and Northport, NE. Completion is scheduled for 1980.

Louisville & Nashville has applied to the Federal Railroad Administration for permission to install new interlockings in Mobile, AL near Choctaw yard. Included will be a new remotely controlled interlocking and conversion of several hand-operated switches to power operation with associated controlled signals.

Missouri Pacific is installing centralized traffic control on 78 miles of line between Alexandria, LA and Livonia. This will complete ctc between Alexandria and Avondale, LA.

Track circuit research is being performed by the Safety Research & Applied Technology division of the Association of American Railroads. A project review committee has defined these goals for track circuit research.

—Increase the capability of the railroads to deal with track circuits.

—Expand the capability of the Communication & Signal section, AAR, to produce effective recommended practices and guidelines concerning track circuits and related devices.

—Provide information and analytical tools to aid in the design and evaluation of track circuits and related devices.

The following tasks have to be done in order to achieve the above mentioned objectives:

(1) Develop a comprehensive file on track circuits. A literature search has been done and a bibliography was distributed in 1977.

(2) Develop analytical and computer models on the track circuit which could be used as research tools. Three computer models were developed. A linear frequency domain model was ready for distribution in March 1977.

(3) Collect the necessary data in order to evaluate and validate the track circuit models. A study to determine the electrical characteristics of modern rail was performed by the University of Michigan. Safetran Systems Corp. developed an instrumentation system to collect field data on the electrical parameters of track circuits. AAR is planning to research interference of track circuits as well as the electrical characteristics of both ballast and ties.

(4) Prepare a track circuit fundamentals handbook containing the necessary information to understand the track circuit. This handbook is being developed and will contain both brief descriptions of typical track circuits and methods of analyzing and evaluating them.

Determine your rights under FELA

Members who are injured on the job and the dependents of those members who have been killed or have died as the result of such injuries should by all means ascertain their rights and benefits under the Federal Employers' Liability Act before attempting any settlement with the railroad.

Below is a list of attorneys who, on the basis of information made available to us, are competent to give full information and assistance to those in need of it.

This list is compiled and maintained on the strength of information furnished us by both attorneys and members. The accuracy of the list that we will publish from time to time depends entirely on the information furnished us. Therefore, everyone concerned is urged to keep us informed regarding cases handled, nature of the case, terms of the settlement, commendations, criticisms, etc.

This information should be forwarded to R. T. Bates, president, Brotherhood of Railroad Signalmen, 601 West Golf Road, Mt. Prospect, Il 60056.

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Tel. (316) 262-6423
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Santa Fe has applied to the Federal Railroad Administration for permission to install traffic control systems in Texas and New Mexico. One ctc installation will replace automatic block signals on single track between Cleburne and Birds, TX, a distance of 12 miles. The other ctc installation is on 10 miles of double track between Gallup and Defiance, NM. This ctc replaces single-diretion running on the two tracks with reversible signaling on both tracks.

Southern Pacific has applied to the Federal Railroad Administration for permission to install a traffic control system on 59 miles of line between Hearne and Giddings, TX. The ctc will replace automatic block signals on 11 miles of the line. The remainder of the line is now non-signaled territory.

Union Pacific has received permission from the Federal Railroad Administration to install a traffic control system on double track between Julesburg, CO and Owasco, NE, about 72 miles. Included is the provision for bidirectional running on both tracks and arranging the cab signal system to so operate. The existing automatic block signaling and cab signals are arranged for current of traffic operation.

Operation Lifesaver will now be a national effort coordinated by the National Safety Council. Operation Lifesaver is a public service program designed to increase public awareness of railroad-highway grade crossing hazards and improve drive/pedestrian performance at these crossings. Operation Lifesaver is now being promoted nationwide under the sponsorship of the National Safety Council in cooperation with Amtrak and the Association of American Railroads.

The goal of Operation Lifesaver is to enjoin all states in support of the program as a means of reducing grade crossing accidents, injuries and property damage on a local, regional and national scale.

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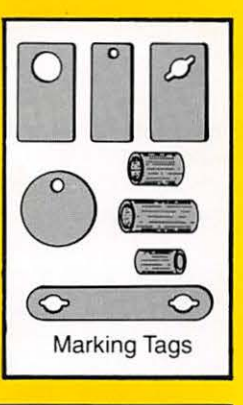
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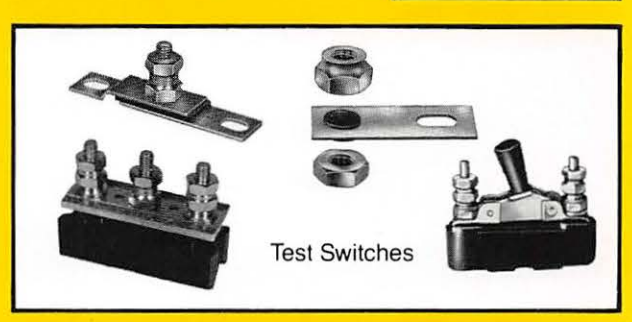
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Signalmen alert public to crossing safety

Brotherhood of Railroad Signalmen working with Safetran Systems Corp. (who provided the equipment) manned a booth at the Union Industries Show in Denver, CO. Exhibit showed the public how grade crossing warning systems operate. Shown below left are (left to right): Richard R. Van Vacter, general chairman, Santa Fe; R. Thomas Bates, BofRS president; and W. D. Best, BofRS secretary-treasurer. Photographs courtesy of Merkle Press.

FRA Safety Inquiry: Part 2

Here is testimony presented to the Federal Railroad Administration safety inquiry in February 1979. Part 1 was published in the April issue. In this part of a special report dealing with signals & train control, the following railroads' testimony is published:

Burlington Northern **(Page 9).**
Chessie System **(Page 22).**
Frisco **(Page 29).**
Missouri Pacific **(Page 42).**
Southern Railway **(Page 46).**
Southern Pacific **(Page 47).**

Walker S. Johnson (right), vice president maintenance & engineering, Burlington Northern, presented testimony in FRA's signal & train control inquiry. Also shown are Michael M. Schultz (left) BN director of signal engineering; and George W. Thompson (center), chief engineer signals & communications, BN.

BN looks at signal inquiry

My name is Walker S. Johnston. I am vice president, maintenance and engineering, Burlington Northern Inc. I have over 42 years of experience, all with the prior merger Chicago Burlington & Quincy and the Burlington Northern Incorporated, with the exception of four years as general manager of the Alaska Railroad.

In my present position I have responsibilities for the mechanical, engineering and safety and rules divisions.

Burlington Northern welcomes this opportunity to participate in evaluating and improving the FRA signal safety standards.

We share the apparent FRA's belief and concern that the existing Rules, Standards and Instructions for signal systems needs revisions to accomplish the intent of the Signal Inspection Act, which act is to promote safety of train operation in the United States through improved maintenance and installation standards of signal systems. We share the FRA's concern with the increasing number of improper proceed signal conditions that are occurring on railroads in the United States. Unfortunately, Burlington Northern's improper proceed signal failures reflect an increase as does the national trend. A large percentage of the increase of improper proceed signal conditions is due to increasing vandalism in the United States. We request the FRA and Federal government's total dedicated participation in reducing this vandalism since Federal and State bodies have full control over legislating laws to reduce vandalism. Burlington Northern pledges its security department to assist Federal, State and local authorities in enforcing the law and protection of our signal systems from vandalism.

We have taken steps to attempt to safeguard our signal system against improper proceed signal conditions created by vandalism. One such step or change in its standards is that we have discontinued purchasing of any searchlight signals and are only purchasing colorlight signals for new installations and replacement purposes. The searchlight signal mechanism is very susceptible to creating improper proceed signal conditions, account vandals shooting into the mechanism, and fragments of glass from the lens within the mechanism falling down and lodging the vane in a clear signal position when such signal position should be stop. Burlington Northern feels they have taken a giant step forward by changing their standards from the use of the searchlights signal to the use of the color light signal. In addition we are using high impact roundels and protectors to alleviate this condition.

Another cause for the increase in improper proceed signal conditions is the vegetation problem in pole lines, where failsafe signal circuits are carried on such pole lines in open line wire. This is not true on our railroad because we have adopted a vigorous program for vegetation control. We have purchased a considerable number of "brush hogs," which machines actually cut such vegetation at ground level and grind such vegetation into small particles. Burlington Northern has further adopted a program for spraying vegetation in an effort to control same. We have both on-track and off-track brush cutting equipment and spraying equipment. We have an annual program to control brush and we are dedicated to making expenditures to accomplish proper control.

Burlington Northern has further improved its stand-

FRA Safety Inquiry

Signal RS&I

ards to the extent that on the new coal haul line we are building for some 126 miles in the State of Wyoming, failsafe signal circuits are carried in underground cable or in lieu thereof, some type of coded track system is being used wherein the failsafe intelligence to operate the signal system is transmitted through the track rails. Our policy is that pole lines should eventually be converted to underground cable installations or other means used to eliminate the need for such pole lines. Our vegetation control program was adopted to control vegetation where failsafe circuits have been installed in open line wires on pole lines in years past. BN does not have the economic capability to replace all of its existing pole line circuits with underground cable or coded track circuits.

An additional item that has created improper proceed signal conditions, although to a lesser extent than the previous two items mentioned, is semaphore signals and mechanical interlockings, but because of restricted economic capability, cannot be replaced. Modern technology and engineering now provide equipment to replace these items, which equipment's false clear occurrence is practically zero. Burlington Northern has adopted a vigorous program to replace semaphore signals with colorlight signals. Our 1979 budget affixes $943,100 to replace semaphore signals with colorlight signals. Our 1979 budget affixes $209,500 in replacing mechanical interlockings. Between January 1, 1976 and December 31, 1978, BN made expenditures of $2,630,060 replacing semaphore signals with colorlight signals and $653,000 replacing mechanical interlockings. We intend to continue with these programs, restricted by our economic capability, until such semaphore signals and mechanical interlockings are replaced with modern signalling systems.

Another area that can improve safety of train operation is through installation of hot bearing detectors and dragging equipment detectors. Burlington Northern's 1979 capital expenditure budget provides for spending $892,600 for installation of hot bearing and dragging equipment detectors. Our 1978 capital expenditure budget provided $1,060,800 for installation of hot bearing and dragging equipment detectors. We have 130 hot bearing detectors in service over the system which has required an approximate expenditure of $9,000,000. Our desire is to install hot bearing and dragging equipment detectors with an approximate 25 miles spacing on all of its main line tracks. However, because of Burlington Northern's restricted economic capability, it will be several years into the future until this is accomplished.

Our signal maintenance standards are of very high quality. We have a signal training program which is compulsory for all new employees hired after September 1, 1972. Burlington Northern has made an expenditure of $2,000,000 training its newly hired employees, which totals 522, this being done to improve our signal maintenance. We desire to conduct additional training for signal employees hired prior to September 1, 1972, but again account our restricted economic capability, we have been unable to accomplish this training.

Our signal maintenance standards are, in general, equal to or in excess of those required by FRA. Where conditions dictate, we require inspections at more frequent intervals than is required and in some instances, our engineering standards for circuit design are more stringent than is required by FRA.

To insure a high level of maintenance, we have added 14 additional signal maintainers, established 5 additional signal inspectors positions and 11 electronic technician positions within the last 3 years.

We are dedicated to and wholehearted believe in the cardinal rule that "Safety is of the first importance in the discharge of duty" and we respect FRA's role in this area, but we also believe that FRA should restrict itself to just that and leave technical matters and the practical applications to the railroads.

Burlington Northern is responding to the issues posed by FRA in an itemized response which is attached to this statement. The responses reflect our experience in attempting to comply fully with the existing requirements of the Signal Inspection Act and the Signal RS&I. We are also attaching proposed revisions to the Signal RS&I which, if the FRA would deem it feasible to adopt such revisions, would provide additional monies for expenditures to:

1. Have greater vegetation control under pole lines carrying vital failsafe signal circuits.
2. More expeditiously replace semaphore signals and mechanical interlockings.
3. Install additional hot bearing and dragging equipment detectors.
4. Enlarge its signal training program to include employees hired prior to September 1, 1972.
5. Provide signal systems on main lines which do not contain such systems.

Burlington Northern's response to the questions posed by the FRA and our attached recommendations for modifications to the Signal RS&I will improve safety to

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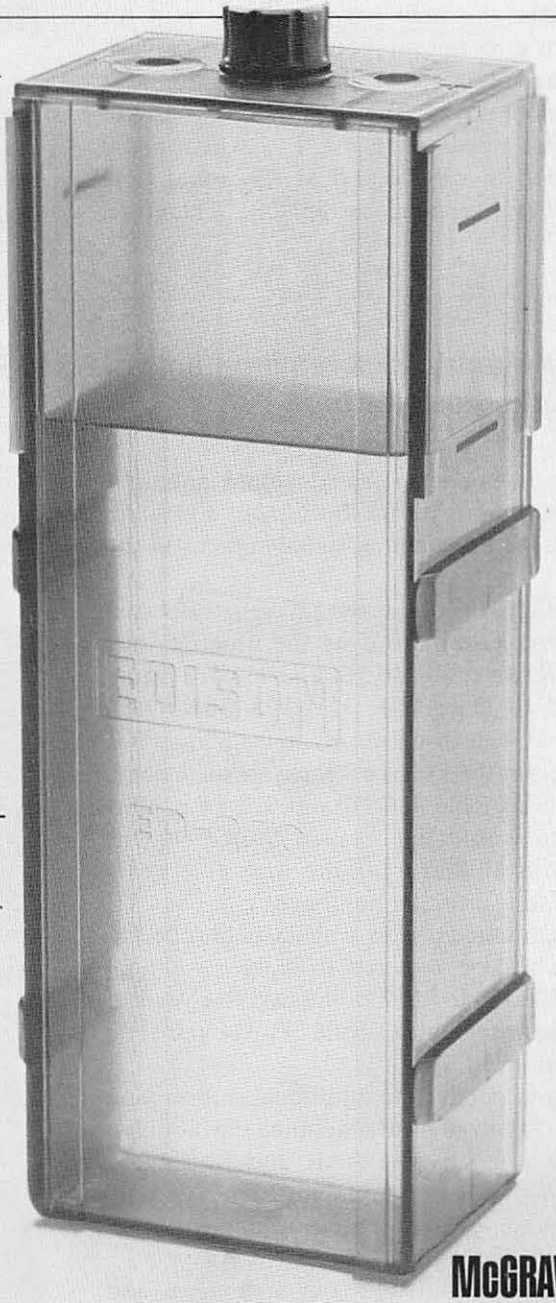

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trains through better signal systems.

Our proposed modification to the signal RS&I in no way will reduce safety but will promote safety by creating additional monies being made available to BN to make expenditures as stated above. As an example, the existing RS&I requirement for approach locking where electric locking is used is that same be tested once per year. The same is true of time locking in Rule 236.378. The route locking requirement of Rule 236.379 where all electric locking is employed is that same will be tested once every three months. Rule 236.380 requires that indication locking be tested once per year for semaphore signals, switches and lock levers and that it be tested once every two years for light signals. Rule 236.381 requires that traffic locking be tested at least once a year. On all of the above named tests, the time period requirement for making these tests does not promote safety but reduced safety through causing us to spend money making tests that do not promote safety. The only time that any of these locking tests need to be made is when signal systems are placed in service and at any other time circuits are modified, repaired or replaced. Therefore,

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the existing FRA RS&I is subtracting from safety by requiring railroads to make tests that fail to promote safety. Another example wherein the existing FRA's Signal RS&I requires railroads to make expenditures

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Elimination of electric lock requirements of RS&I Rules 236.314 and 236.410 would provide savings to Burlington Northern.

To support our statement that signal maintenance is of high standard and quality on the Burlington Northern, we spent $25,771,347 maintaining signal systems in the year 1978.

We would also like to submit the savings to BN that would result from elimination of the electric lock requirements of RS&I rules 236.314 and 236.410. From January 1, 1976 to December 31, 1978 Burlington Northern installed 54 electric locks when installing CTC on the coal routes on the Denver Region. If the electric lock requirements of Rule 236.410 did not exist, Burlington Northern would have saved $624,597. Our projected CTC installations for the next five years contemplate installing a similar number of miles of CTC as in the above mentioned period, which would reflect at today's costs, we will be required to make an annual expenditure of $208,199 for each of the next five years, if the electric lock requirements of Rule 236.314 and Rule 236.410 are not removed.

We would like to submit the additional information relative to savings involved if FRA adopted the modified rules as recommended by the AAR and Burlington Northern. Savings to Burlington Northern annually through the recommendations of modification for Rules 236.106 and 236.108 would be $559,650.

We would further submit that our statements and answers to the questions posed by the FRA will reflect that our recommendations will in no way reduce safety of train operation but will improve safety of train operation through installation of additional signal systems and hot bearing detectors and improved maintenance with the monies saved.

which fail to promote safety is the electric lock requirements of Rule 236.314 and Rule 236.410. It is Burlington Northern's recommendation that the only requirement for installing electric locks on hand throw switches should be the requirement contained in Rule 236.301. An electric lock on a hand operated switch does not prevent a train or engine from pulling past the clearance point and into the path of a train moving on the main track in either direction. Burlington Northern's operating Rule 268 requires that trains "must not foul or enter the main track or a controlled siding at a hand operated switch unless governing signal displays an indication to proceed or authority is obtained from the control operator". Our signal systems are dependent upon rule compliance. When a signal displays a stop indication, our trains comply with the stop indication displayed. Should FRA remove the electric lock requirements of Rule 236.314 and Rule 236.410, we would continue to vigorously pursue compliance with our Operating Rules.

Again, the money saved through elimination of the electric lock requirement would be expended to improve safety on the Burlington Northern as previously stated.

Part 235 of Title 49 CFR requires that railroads make application to the FRA and gain FRA's approval prior to discontinuance or material modification of a signal system. We recommend that this part be modified to the extent that the only time that application to the FRA for making signal changes would be required, is when a signal system is to be retired and trains continue to operate on such railroad. There is no need whatsoever to make application for other modifications to the signal system since in no way can safety be reduced through such modifications, since all such signal modifications must comply with FRA's Signal RS&I. The requirements of Part 235, as it now exists, is causing us to make expenditures in preparing applications that do not promote safety. In addition, at this time it is taking an average of 186 days to receive approval from the FRA on applications. This is a severe handicap to us since same restricts us from proceeding with the various projects and in some cases prohibits us from placing signal systems in service. FRA through the requirements of Part 235 is reducing safety to trains through prohibiting placing signal systems in service until authority is received.

Burlington Northern again wishes to express its pleasure in being able to participate in this endeavor to modify the RS&I for signal systems to promote safety of train operation.

BN answers FRA questions

1- Factors in revising regulations.

The purpose of the S&TC regulations and orders is the achievement of safety of railroad operations. In light of this purpose, what are the principal factors which FRA should consider in revising them?

The principal factors to consider in revising the RS&I are:

A. Remove or revise existing requirements that do not improve or promote safer railroad operation.

B. The practicality of the railroads economic ability to comply with revised rules and standards that would require large railroad expenditures for compliance.

C. Any changes in the RS&I should contain uniformity to the greatest extent possible.

2- Minimum requirements.

The S&TC regulations are intended to be minimum safety requirements. Do "minimum requirements" encourage lower levels of inspections, maintenance, testing, or repair of signal systems?

Minimum safety requirements do not encourage lower levels of inspection on the Burlington Northern. As an example, RS&I requirement for inspection of switches per Rule 236.103 is 3 months. Our requirement is at least once per month. The same is true of testing requirements for shunt fouling circuits per Rule 236.104. RS&I requirement is 3 months. This Company's is one month. FRA RS&I requirement for switch obstruction test per Rule 236.27 is that switch cannot be locked up with ⅜" obstruction in switch point. Our requirement is ¼".

3- Regulations and change.

Do the existing regulations deter either the upgrading of existing signal systems that are obsolescent or obsolete or the initial installation of signal systems?

The existing requirements deter improvements to Signal Systems by requiring testing and record keeping that does not improve safety. If this were eliminated, the moneys spent on this testing could be used to install new signal systems and renew old signal systems. Another example is the electric lock requirement of Rule 236.410. These electric locks do not improve safety and if this requirement were removed, these moneys could be spent for additional signal systems and renewal of older systems.

4- Regulations and flexibility.

Are the existing regulations sufficiently framed as performance standards so as to encourage technological development of S&TC systems, devices, or apparatus? How could the regulations be made more flexible to allow for greater technological innovation without detracting from safety?

The existing regulations do not prohibit technological development. Burlington Northern does not have knowledge of any changes in existing regulations that could be made that would promote technological innovation without detracting from safety.

5- Personnel qualifications.

There are currently no specific Federal requirements concerning the qualifications of railroad personnel who install, maintain, and test S&TC systems. Should there be such requirements, and if so, what should they be?

It is the railroads responsibility to train their employees sufficiently so that systems are installed and maintained equal to or better than RS&I requirements.

6- Vandalism areas?

In many areas, one of the major causes of signal problems is vandalism. Should additional circuit redundancy or other protective measures be required in areas with a high incidence of vandalism?

The railroads have taken additional safety measures to assure safety in high vandalism areas. The Burlington Northern does not recommend requirements of redundancy circuits in high vandalism areas principally because it would be very difficult or impossible to affix a definition for such areas. The solution to this problem is to address it with measures which will discharge vandalism.

7- ICC order on train control.

In 1922, the ICC issued Order No. 13413 requiring the installation of automatic train control devices over segments of the lines of certain railroads in accordance with prescribed specifications. Over the years, many railroads have obtained relief from some of the requirements of this Order.

(a) Since many of the requirements of the Order are now included within the RS&I is there any need to continue the Order as a separate docket?

We believe that voiding Order 13413 is long overdue. It was more than 50 years ago that the ICC stated "We therefore believe that vigorous efforts to provide adequate protection against the large number of accidents which arises from other causes will afford a far greater measure of safety than requiring by order special efforts to extend train control installation." There is no need to continue the Order.

(b) If the general requirements of the Order are incorporated in the RS&I, what provision should be made concerning relief from specific requirements granted to individual railroads?

Most relief from this order was authorization for complete removal of the train stop, following a formal hearing at which parties of interest were represented. It would seem that any outstanding problems of relief could be individually handled or they could be resolved by general fiat.

Burlington Northern is not aware of any relief granted to Burlington Northern on a system wide basis. Such relief has only been granted in a designated area. Therefore, such relief for that specific area would continue as is.

8- Where signals required.

In 1947, the ICC issued Order No. 29543 requiring the installation of a Block Signal System on any portion of railroad over which passenger trains are operated at speeds of 60 or more miles per hour or freight trains are operated at speeds of 50 or more miles per hour and the installation of an automatic trainstop, train control, or cab signal systems on any portion of railroad over which trains are operated at 80 or more miles per hour.

(a) The FRA is considering incorporating the requirements of the Order in the RS&I. Is there any reason this should not be done?

NO — Providing speeds remain as now exists.

(b) Are the speed restrictions adequate in today's operating environment? What other factors, if any, should be considered in determining whether signal systems are required to assure safety? For example, taking into account present operating conditions such as longer trains carrying more hazardous materials, should the maximum speed at which freight trains may operate in non-signal territory be changed?

Yes

Existing critera for requirement for S&TC are adequate and we do not think safety would be improved through more stringent requirements.

NO

(c) Should the maximum speed at which trains are permitted to operate in other then automatic trainstop, train control, or cab signal territory be changed?

NO

(d) Should automatic train control be mandatory above certain speeds or under certain other circumstances?

NO. Existing requirements of the law in this regard are adequate.

9- Reporting requirements.

One of the requirements of Part 233 is the immediate reporting to FRA of each accident caused by the failure of any S&TC device. FRA recognizes the need to revise this requirement to conform to the Accident/Incident Reporting Requirements of 49 CFR Part 225. What other changes, if any, should be made in reporting requirements of Part 233?

Part 233 requires reporting of improper proceed Signal failures. If no improper proceed signal failures occur in a given month, railroads are still required to file a report showing that no improper proceed failures occured. Burlington Northern recommends that this requirement of the law be removed since it serves no purpose.

10- Discontinuance or material modification

Part 235 prescribes requirements and procedures for obtaining FRA approval prior to discontinuance or material modification of a signal system under paragraph (b) of the Signal Inspection Act. Although Part 235 specifies certain changes for which aproval is not required, there are still a large number of applications for approval of changes

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that would result in equivalent or improved safety. To avoid unnecessary paperwork, delay and expense, there appears to be a need to develop criteria to allow additional changes without FRA approval.

The current working definition of the term "discontinuance" is the cessation of an S&TC system on track that remains in service for any railroad operations. A "material modification" includes, but is not limited to, changes in the type of signal system, respacing involving removal of signals for reduction of maintenance costs, conversion of a power-operated switch or derail to one operated by hand or spring, and any series of discontinuances or modifications which do not individually require FRA approval but will eventually result in a change requiring FRA approval. What changes, if any, should be made as to what constitutes "discontinuance" or "material modification" of a signal system?

Material modification — requirement for FRA approval for changes in the type of signal system should be discontinued as long as safety is not reduced. Respacing of signals to reduce maintenance costs should not require FRA approval since it does not reduce safety of train operation. It would only reduce the track capacity. Conversion of a power-operated switch or derail to one operated by hand or spring should not require FRA approval since this in no way reduced safety.

11- No prior approval

FRA recognizes that some situations such as derailments and abandonments make prior approval of "discontinuances" or "material modification" impracticable or unnecessary. Section 235.3 lists those circumstances in which prior approval is not now required.

(a.) Are there other situations in which changes in signal systems should be permitted without prior FRA approval? What, if any, measures should be required to assure safety if prior approval is not required?

The purpose of the Signal Inspection Act was to improve and promote safety of railroad signal systems. Changes in signal systems should be the prerogative of railroad management to fit changing operation condition on a timely basis. With this in mind, application and FRA approval should not be required for any signal changes unless safety is reduced. Therefore, the only time that application and FRA approval should be required for signal modifications is when a signal system is completely retired and trains are still being operated on that portion of the railroad. All other changes and modifications must comply with the RS&I and there should be no further measures required to assure safety.

(b.) What methods other than track circuitry could be used to provide protection on light density lines?

We do not have knowledge of any systems, other than continuous track circuits, that are fail-safe.

(c.) The removal of any signal in an S&TC system is prohibited except to provide adequate stopping distances. Are there other circumstances in which removal of individual signals should be allowed without prior approval?

The purpose of the Signal Inspection Act was to improve and promote safety of railroad signal systems. With this in mind, application and FRA approval should not be required for any signal changes unless safety is reduced. Therefore, the only time that application and FRA approval should be required for signal modification is when a signal system is completely retired and trains are still being operated on that portion of the railroad. All other changes and modifications must comply with the RS&I and there should be no further measures required to assure safety.

(d.) Temporary or permanent signal arrangements are permitted without FRA approval if they are necessitated by rail-highway grade separations or catastrophic occurrences. Increasingly in such instances, railroads establish "permanent arrangements" that in actuality constitute "discontinuances". Should railroads be required to report all catastrophic and other occurrences that result in removal of any portion of an S&TC system for a specified period of time? Should an approval procedure be required for all arrangements that are continued past a specified time?

The inference here is that the railroads use catastrophic occurrences to "get around" the requirements of Part 235. Without specifics, it is difficult to accept this as factual. Any temporary measures taken must comply with the RS&I. Should the catastrophy be such as an ice storm, hurricane, fire, etc. that may require that the signal system be removed from service in order to continue to operate trains on a practical basis, Burlington Northern has no objections to a reasonable specified time period after which reporting would be required.

12- Other application data.

Sections 235.11 and 235.12 specify the contents required in applications for approval.

The purpose of the Signal Inspection act was to improve and promote safety of railroad signal systems. With this in mind, application and FRA approval should not be required for any signal changes unless safety is

reduced. Therefore, the only time that application and FRA approval should be required for signal modifications is when a signal system is completely retired and trains are still being operated on that portion of the railroad. All other changes and modifications must comply with the RS&I and there should be no further measures required to assure safety.

The following answers only apply to applications made for discontinuance of signal systems on railroads where trains will continue to be operated.

(a.) Should other data, such as circuit plans, be required? Should any of the present data requirements be reduced or eliminated?

NO

Considering our opening statement, Burlington Northern recommends that no changes be made in the existing data requirements.

(b.) Should the starting and completion dates for the proposed changes be included in the application? Should each approval be conditioned upon completion of the change within a prescribed period following the scheduled completion date?

Approval should not be conditioned upon completion of the project in any given time period.

13- Federal Register publication

Notices of applications for approval of material modifications are mailed to each individual or organization that has requested inclusion in a central mailing list. Should these notices be published in the Federal Register instead?

Burlington Northern recommends that notices of applications be published in the Federal Register, in lieu of present handling. However, should such change of handling increase the time required to receive approval of applications, we would recommend no change in handling.

15- Plans

Section 236.1 specifies that plans for signal systems should be legible and available for use at designated central locations.

The territory for which a signal maintainer is responsible may be extensive. Hence, a trouble call may arise at some distance from where plans are kept. Is there a need to require the plans to be kept at more accessible locations?

BN keeps circuit plans for a specific location at that location. We have no objection to making this an RS&I requirement.

16- Changes on plans

During changes in signal systems, circuit changes are marked in color or symbolically. Should use of plans so marked be permitted subsequent to the completion of the changes?

Use of the colored plans reflecting changes in circuits should be allowed to be used as circuit plans subsequent to completion of the project for a reasonable period of time.

17- Repair without undue delay

Section 236.11, which was issued in its present form by the ICC in 1966, has been the source of considerable controversy. Section 236.11 requires that "when any component of a system or interlocking, the proper functioning of which is essential to the safety of train operation, fails to perform its intended signalling function, it shall be adjusted, repaired or replaced without undue delay." Subsection (e) of the Signal Inspection Act provides in part: "It shall be unlawful for any carrier to use or permit to be used on its line any system, device, or appliance covered by this section unless such apparatus, with its controlling and operating appurtenances, is in proper condition and safe to operate in the service to which it is put, so that the same may be used without unnecessary peril to life and limb. . . . "

Problems of interpretation have arisen concerning the meaning of the words "undue delay." In general, FRA has taken the position that immediate action must be taken to assure the safety of train operations, but that adjustment, repair, or replacement of components may sometimes be deferred for a short time until parts or personnel are available. That is, FRA has recognized that temporary additional safety measures may permit traffic to continue over the line prior to completion of the necessary repairs and adjustments. However, in some cases any delay is "undue", and immediate repairs must be made.

a. How should section 236.11 be amended to specify when these repairs and adjustments must be completed?

Rule 236.11 does not need to be modified. The railroads interpretation of the Rule is "any repairs or adjustments required to keep the systems, device or appliance, in proper condition must be undertaken without undue delay when train operations are immediately pending".

b. Should explicit time requirements be set forth for correction of various categories of signal failures?

Rule 236.11 does not need to be modified. The railroads interpretation of Rule 236.11 is that an improper proceed signal condition should be corrected immediately, even though a train movement is not immediately pending.

c. In view of the fact that a "false restrictive" indication could be caused by a ground or a broken rail, should railroads be required to investigate immediately each "false restrictive" indication and to take appropriate remedial action?

The railroads should be required to investigate the cause only as train operations require.

d. What is the current practice of individual railroads concerning the investigation and correction of "false restrictive" indications?

This railroad's present practice is to investigate "false restrictions" indications as train operation require.

e. Should Section 236.11 address system failures, as well as component failures?

Burlington Northern puts forth every effort to restore CTC and ABS systems when same fail due to ice storm, fire, etc. and restore same without undue delay.

18-21 Solid-State Equipment

Technological advances have resulted in widespread use of electronic equipment of the solid state type in S&TC systems. There are no FRA regulations that specifically address this equipment.

18. *Should FRA prescribe performance standards for solid state equipment used in S&TC systems?*

FRA regulations generally now provide performance standards for signal systems and we do not see the necessity for government standards on solid state equipment used to meet such system standards any more than specifying standards for relays and other conventional signal devices.

19. *Should FRA require a safety analysis of all solid state equipment?*

Safety analysis of solid state equipment is properly vested in the manufacturer and the user. The record does not reflect that this group has been derelict in their duty as, at no time, has safety been compromised. Safety analysis on the part of FRA would not, in our opinion, be cost effective.

20. *Section 236.8 requires that electromagnetic equipment be maintained within the limits in which it is designed to operate. Should this requirement be extended to solid state equipment?*

The requirements of Section 236.8, as applied to electromagnetic devices, should be extended to solid state equipment used to perform a vital function. As an example, solid state devices used to replace an electromagnetic track relay should meet the same requirements as the device replaced when performing a vital function. Solid state devices, used in non-vital applications, should not be subject to this requirement.

21. *What, if any, inspection and testing requirements should be prescribed for solid state equipment?*

Solid-state equipment should meet the signal suppliers specifications furnished with the equipment and meet the testing requirements of the existing RS&I.

22-24 Roadway Signals

22. *A large number of the requests for waiver of requirements of the RS&I involve placement of roadway signals (Section 236.21). Many of these waiver requests are granted because the prescribed placement of signals to the right of track is often impractical or not required for safety of operations. How can this placement requirement be changed to eliminate the need to file those waiver requests?*

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Modify Rule 236.21 to read as follows, "Locations of Roadway Signals — each roadway signal must be positioned and aligned so that its aspects can be clearly associated with the track it governs".

23. *The spacing of roadway signals (Section 236.24) is based upon braking distances of maximum tonnage trains operating at track speed. There are no industry-wide standards for train stopping distances. Should FRA establish uniform standards to assure that signals are adequately spaced?*

Uniform braking distance charts cannot be established since different railroads use different means of braking trains. Brake pipe pressure also varies from railroad to railroad. Therefore uniform stopping distance charts cannot be adopted. The existing rules regarding signal spacing are adequate to assure safety.

24. *Due to improper location of a signal with respect to insulated joints, a locomotive may occupy a block without shunting the track circuit. Where route locking is provided, protection is given by requiring that route locking be effective before the first set of wheels of the locomotive has passed more than 13 feet beyond the signal governing its movement. (Sections 236.302 and 236.408). Should other signals by required to display their most restrictive aspect before the locomotive has passed more than 13 feet beyond them?*

The 13-foot limitations in Rules 236.302 and 236.408 were prescribed to cover specific situations, the likes of which do not exist in other areas. No useful purpose would be served by requiring 13-foot measurements as suggested.

25-26 Track Circuits

25. *Should standards be developed to prescribe the maximum permissible foreign current in track circuits?*

BN has rules and instructions to require that the signal system be placed in its most restrictive position whenever the track is made unsafe for train operation. "There are

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so many varying types of track circuits and track relays, it would be very difficult to establish maximum permissible foreign current in track circuits. Although such requisites may supply some help to the railroad signal sections in their negotiations with power companies and pipe line companies, it would be difficult to establish any meaningful maximums. Therefore, our answer is NO."

26. *Section 236.51 requires that a track circuit be de-energized under certain conditions.*

a. Should the removal of a crossing frog be one of those conditions?

BN has rules and instructions that require that the signal system be placed in its most restrictive position whenever the track is made unsafe for train operation and we quote: "G15. When rail is being laid or other track changes are being made which render the track unsafe for passage of trains, signals or other controlling devices shall be arranged to provide protection. The signals or other controlling devices shall not be restored to normal operation until tests have been made and it is known that they function as intended, and that the track is safe for the passage of trains."

b. The track circuit must be de-energized when a car occupies the fouling section of a turnout. Problems occur when the limits of the fouling section are not sufficient to safely accommodate the overhang of certain equipment beyond the nearest wheel contact point. Should FRA prescribe minimum standards for clearance points?

Burlington Northern is not aware of any accidents or incidents that have occurred account our clearance standard being insufficient. Therefore, we do not see any great advantage to an FRA minimum clearance standard.

27- Wires and Cables

The existing regulations for wires carried over pole lines require only that they be tied in on insulators (Section 236.71) and that sufficient clearance be provided where persons are permitted on top of cars (Section 236.72).

a. Should FRA prescribe other safety requirements for pole lines?

Rule 236.2 requires that all circuits, the functioning of which affects safety of train operation shall be kept free of grounds or combination of grounds which will permit a flow of current equal to or in excess of 75 per cent of the release value of any relay involved. This pertains to line wires, the functioning of which affects safety of train operation. This rule now exists and no further FRA safety requirement is needed.

b. Section 236.108 sets minimum allowable resistance standards for wires other than those carried over pole lines. Should FRA prescribe minimum allowable resistance standards for wires carried over pole lines?

We see no need for allowable resistant standards for wires carried on pole lines. Many line wires are not insulated although they may have a weatherproof covering.

28-33- Inspections and Tests

The existing regulations identify the devices that are to be inspected and tested and prescribe the frequency of those inspections and tests. The method of inspection and testing is determined by the railroad subject to FRA approval. Each device and apparatus must be maintained in condition to perform its intended function.

28. *Are railroad inspection and test methods adequate or should FRA prescribe uniform requirements for the performance of each inspection and test?*

As stated in the paragraph preceding this question, the method the railroads use to perform the testing and inspections is subject to FRA approval. Therefore, uniform methods for testing and inspection are not required as long as the results of the testing and inspections comply with the requirement of the Rule.

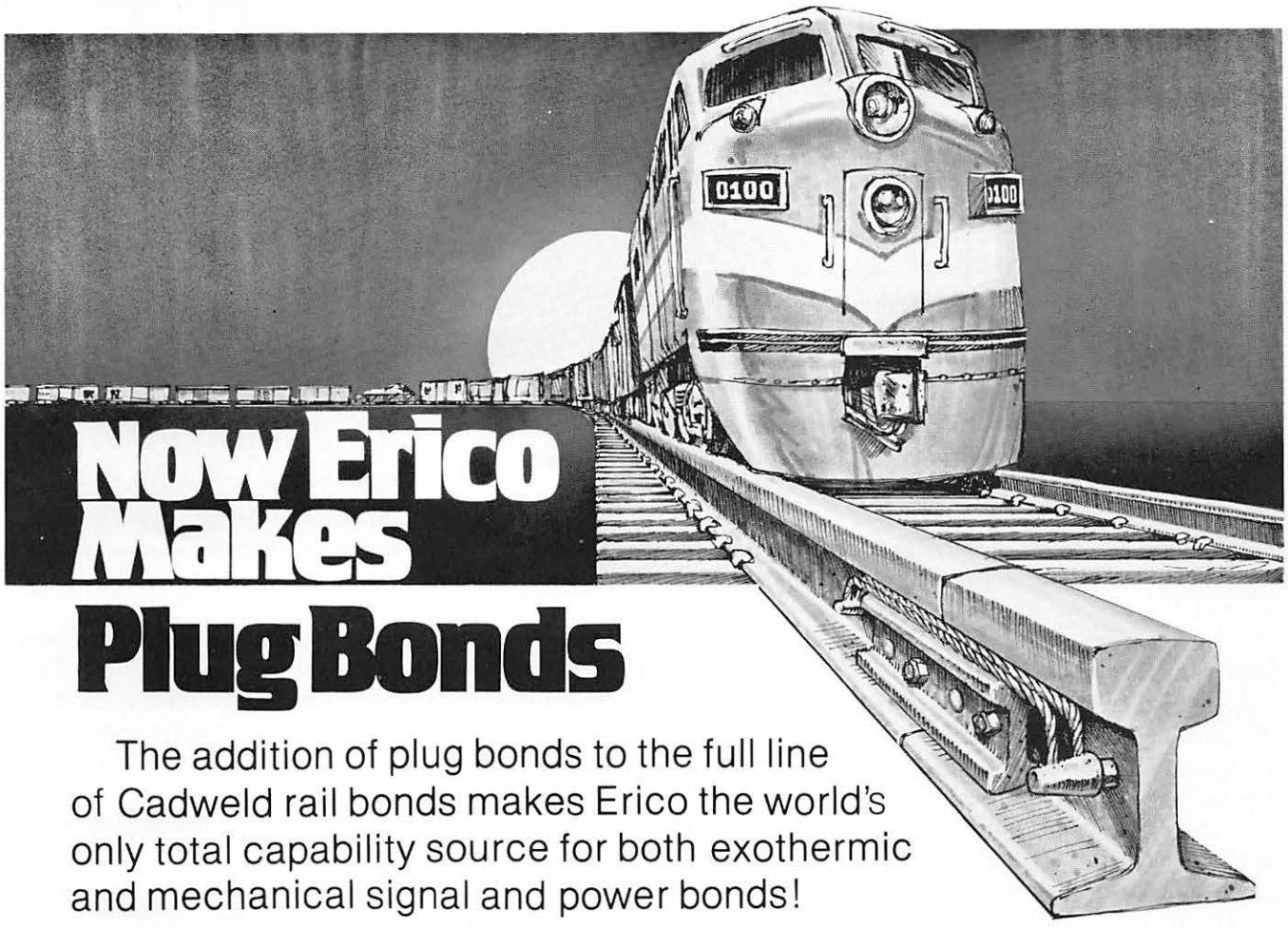
29. *There are no requirements for the performance of operating tests to determine whether a device or apparatus functions as intended.*

a. Errors in connection or adjustment of devices are a frequent cause of false proceed signal failures that could be avoided by proper operational testing after installation or adjustment. Should operating tests designed to determine whether a device or apparatus functions as intended be required subsequent to installation or adjustment?

Burlington Northern fully intends to comply with all provisions of the RS&I. Compliance with these rules requires that operating tests be made immediately subsequent to making any adjustment, change, replacement, repair or placing new signal system in service. Therefore, the requirement for operating tests exists with the present RS&I even though not stated.

b. Should operating tests also be required periodically?

Burlington Northern fully intends to comply with all provisions of the RS&I. Compliance with these rules requires that operating tests be made immediately subsequent to making any adjustment, change, replacement, repair or placing new signal system in service.



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Therefore, the requirement for operating tests exists with the present RS&I.

30. *Grounds are a major cause of false proceed signal failures but are not subject to periodic testing. Should such tests be required?*

Burlington Northern standards require that tests for grounds be made at least once per month. BN and AAR recommendations for revisions in the RS&I require making a ground test at least once every three months.

31. *The frequency of the various periodic inspections and tests required of S&TC equipment is specified in the following subsections of Part 236: .102-.108, .376-.387, .476, .576, .577, 588-.590.*

a. Certain equipment such as semaphore signals and relays and mechanical interlockings, is no longer manufactured. Does the age and failure potential of this obsolete equipment make more frequent inspection and testing necessary to assure safety?

Account the manner in which this question is stated, the answer is NO. There are certain pieces of signal equipment, because of the lack of ability to obtain replacement parts, require additional tests and inspections which railroads now make without an RS&I requirement. However, defining those pieces of equipment has to be on an individual basis and not bunched as to certain types of equipment. Also age alone is not a factor of failure potential. Therefore, the answer is NO.

b. Are there newer and improved types of equipment that need less frequent inspection and testing?

Cost benefit analysis would not support many of the tests presently required by RS&I. As an example, traffic locking need only be tested when a signal system is placed in service and when change or replacement is made in any part of the system. The one year requirement for this test serves no purpose. Therefore, the answer is YES.

c. Within the past five years, there have been two major accidents involving fatalities caused by defective bridge locking. Considering the accident history and the stresses usually imposed on such moving parts, should moveable bridge lockings be tested more frequently than annually (Section 236.387)?

The proper maintenance of the bridge locking equipment will prevent accidents. There is no reason to test bridge locking once per year. If the locking is electric, there is no need to test it except when originally installed or when change or modification is made to the electric locking. Therefore, the answer is NO.

33. *Records of the required tests must now be filed in the office of the division in which the tests were made (Section 236.109). Should additional locations be allowed? How long should these records be retained?*

Records of required tests are presently required to be filed in the office of the divisional officer of Division on which tests were made. Present organizational arrangement dictates that we have supervisory personnel headquartered away from the division headquarters. There people have direct supervision over employees performing the required tests; therefore, the test records should be filed in their office. This would eliminate duplication of records and would have no adverse effect on safety.

Only the record of the last required test should be required to be retained.

34- Automatic Block Signal Systems

Section 236.204 requires in part: "In absolute permissive block signaling when a train passes a head block signal it shall cause the opposing head block signal to display an aspect requiring a stop." This requirement permits opposing trains operating on the same track to meet at locations where there is no siding. Should Section 236.204 be amended to require that whenever a train passes a head block signal "it shall cause the opposing head block signal at the next siding to display an aspect requiring a stop".

Rule 236.204 does not need to be modified to prevent opposing trains to enter the same block. Rule 236.204 now provides for safety of train operation and modification of this rule as suggested in the question, would not improve safety.

35-37 Interlockings

35. *Are the current regulations governing interlockings appropriate for the present railroad environment?*

The revisions to the RS&I that Burlington Northern and the AAR are jointly recommending, will amend the regulations governing Interlockings satisfactory and appropriate for the present railroad environment.

37. *Section 236.313 sets forth specifications for pipe used in operating connections at interlockings. Are these specifications appropriate? Should there be similar specifications for pipe in all S&TC systems?*

This rule has limited applicability today and could probably be eliminated. Pipe connections could be welded. The rule should be modified to allow for

welding. We are not aware of any uses for pipe in signal systems outside of Interlockings or CTC control points.

38-39 Traffic Control Systems

38. *Section 236.401 specifies the automatic block signal and interlocking standards that are applicable to traffic control systems. Are these standards adequate?*

The standards will be adequate when revised as per Burlington Northern and AAR recommended modifications to the RS&I.

39. *Should FRA specify where signals must be provided in traffic control systems?*

There isn't any need for FRA to specify where signals should be provided in traffic control systems. Placement of signals should be prerogative of the railroad based on traffic density. Burlington Northern recognized that such installation will have to comply with provisions of the RS&I.

40-45 Automatic Trainstop, Train Control, and Cab Signal Systems

As explained above, Subpart E of Part 236 contains many requirements that overlap those of the Order issued in ICC Docket No. 13413. Therefore, many of the issues applicable to Subpart E have already been addressed in the discussion of ICC Docket No. 13413 and will not be addressed here. FRA recognizes that Sections 236.527, 236.530, 236.533, 236.558, and 236.559 address systems that are no longer in service and intends to amend or delete these sections as appropriate.

40. *Are the rules, standards, and instructions for automatic trainstop, train control, and cab signal systems contained in Subpart E otherwise appropriate in today's railroad operating environment?*

The RS&I should be revised as recommended by Burlington Northern and the AAR.

41. *Should the minimum allowable insulation resistance between wiring and ground prescribed in Section 236.552 be increased?*

Burlington Northern recommends that rule remain as now exists.

42. *Seals are currently required on automatic trainstop and train control devices in the locomotive.*

a. Should seals be imprinted in a manner that indicates the place of application?

Only necessary that a seal with a distinguishing marking be used.

b. Should seals also be required on automtic cab signal devices?

We are unaware of any safety problem resulting from seals not being applied to cab signal devices. If such problem is apparent, then consideration should be given to use of seals as a possible method of overcoming the problem.

43. *Section 236.567 permits a locomotive with an S&TC device that fails en route to continue to its destination under certain restrictions. Under this regulation, a train may travel long distances in equipped territory without the protection of the devices and may even pass through one or more established facilities for testing and repair of the devices. Should the prompt repair of the failed device or substitution of a locomotive with operative device be required?*

The restrictions provided in Rule 236.567 are adequate to provide safe train operation. A requirement for prompt repairs would place an economic hardship on the railroads that would not be practical. We suggest this Rule be modified per our revised RS&I recommendations attached. (See AAR revisions, June TSJ)

44. *Devices on lead locomotives must be tested within 24 hours before use in equipped territory (Section 236.586). In some cases, trailing locomotives not so tested are removed during the trip and used as lead locomotives in other service in equipped territory. Should a daily test of devices on other locomotives in a consist be required?*

This railroad employs a cab signal system in its suburban passenger operation for 38 miles from Chicago to Aurora, IL. We do not have any other cab signalling. The requirement suggested in this question would not place any hardship on Burlington Northern, but very possibly could on other railroads. However, the restrictions provided in Rule 236.567 and 236.588 as we and the AAR have recommended they be modified, will provide adequate restrictions and safe train operation.

45. *Records must be now made of the results of the various tests performed on locomotive devices. However, except for the departure test usually performed by or in the presence of the engineer, the results of the tests are not available to the engine crew. In the case of interdivisional runs, the relieving engineer does not have access to the results of the departure test. Should copies of all tests be required to be kept in the cab of the locomotive?*

Burlington Northern and the AAR have made recommendations for revisions to the RS&I. These recommendations include revisions to Rule 236.587 which states that if departure test is made by an employee other than engineman, the enginemen shall be informed of the results of such test and a record kept there of. This requirement should be adequate for safety.

46-47 Definitions

Subpart G of Part 236 defines terms intended to be applicable to all sections of the rules, standards, and instructions for signal systems.

46. *Section 236.831 (a) defines main track as excluding auxiliary tracks. Section 236.410 requires the use of an electric lock on switches on main track in traffic control territory where speeds exceed 20 miles per hour and train movements are governed by signal indications. FRA has always held that these requirements apply to signaled*

sidings. However, this has been challenged recently. The problem arose when the present definition of main track was adopted to prevent the applications of Sections 236.502 and 236.504 to sidings. Apparently no consideration was given to the possible effect of this change on other sections. FRA believes that the following definition of main track: "A track, the use of which is governed by block signals, or upon which trains are operated by timetable or train orders, or both" together with appropriate amendment of Sections 236.502 and 236.504, would clear up the present confusion. Would these changes create other problems?

Burlington Northern's recommendations for modifications to the RS&I, is to delete Rule 236.410 and 236.314. The requirement of installing electric locks on hand operated switches in CTC territory or interlockings does not promote safety. An electric lock does not prevent a train or engine from pulling past the clearance point and into the path of a train moving on the main track in either direction. Burlington Northern's Operating Rule 268 requires that trains 'must not foul or enter the main track or a controlled siding at a hand-operated switch unless governing signal displays an indication to proceed or authority is obtained from the control operator". Any signal system is dependant upon rule compliance. When a signal displays a stop indication, our trains comply with the stop indication displayed. Should FRA remove the electric lock requirement of Rule 236.410 and 236.314, we would continue to vigorously pursue compliance with Burlington Northern operating rules. Therefore, recommends that the only requirement for use of electric locks, wherein, safety would be enhanced, is contained in Rule 236.301.

The monies saved through elimination of the electric lock requirement, would be expended on installation of additional hot bearing detectors, additional CTC systems, and improved maintenance of existing signal systems.

47. *Where can the definitions be improved? Do any further terms need to be defined?*

Any information in the form of definitions can usually be improved upon from time to time, and signal definitions are no exceptions. We believe this best approach would be to select a small ad hoc group of interested parties to revise and correct where necessary.

48-51 Remotely Controlled Locomotives

Techonological advancement has proven the feasibility of remotely controlled locomotives in railroad operations.

The following answers are supplied to FRA's questions and such answers apply to remotely controlled locomotives used in main line train service. They do not apply to remotely controlled locomotives used in yard switching service. Burlington Northern is opposed to any FRA establishing any Rules, Standards or Instructions governing remotely controlled locomotives used in yard switching service. We are not aware of any accidents, or unsafe conditions that have resulted from remotely controlled locomotives used in yard switching service.

48. *Should all transmitting and receiving channels of remotely controlled locomotives and their controlling locomotives be tested prior to departure to ascertain that they function properly?*

Railroads who use remote control equipment use elaborate pretrip checks which includes verification that transmitting and receiving functions are working. Additional requirements for safety are not needed.

49. *Should there be a Federal requirement that loss of continuity of a predetermined duration will automatically result in shut-off of power in the remotely controlled locomotive? What should this duration be?*

NO. Various railroads have operating conditions which require different over-ride times when a loss of continuity may occur. Present protective features to nullify this override function provide for safe operation. No limit is required when the protective shutdown features are available through a pneumatic brake pipe.

50. *Should a predeparture test be required to verify that the feed valves on all remotely controlled locomotives automatically close following loss of continuity or application of the brakes on their controlling locomotives?*

The railroads recognize the importance of nullifying feed valves during loss of signal and accordingly dual sensors have been provided for this purpose. No additional Federal requirement is needed.

51. *Should physical deactivation of the command modules on all remotely controlled locomotives be required before their controlling locomotive is removed from the train consist?*

NO. Deactivation of the command modules on all remotely controlled locomotives can be safely done either before removing the locomotive from the train or after they have been removed. This depending on the railroad operating situation and location when locomotives are to be removed.

Comments of the Chesapeake & Ohio, Baltimore & Ohio and Western Maryland

I. INTRODUCTION

The following comments are presented on behalf of The Chesapeake and Ohio Railway Company, The Baltimore and Ohio Railroad Company, and Western Maryland Company (hereinafter referred to as the "Chessie System" or "Chessie") in response to the notice published by the Federal Railroad Administration ("FRA") in the Federal Register dated Tuesday, December 12, 1978.

In this, the last of five "General Safety Inquiries", Chessie will briefly summarize the rail safety regulatory

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approach we discussed in our earlier presentations, explain how that approach can be implemented in the signal area to produce more effective regulations, and finally we will attempt to clarify some of the issues raised during the prior hearings which have caused some conceptual difficulty.

Chessie will not discuss all of its technical objections to the present signal regulations, nor will we offer separate responses to each of the 51 questions raised by the FRA; rather we will concentrate on specific issues which more fully explain the position of Chessie. We are completely familiar with the written and oral testimony of the AAR and its responses to the 51 questions and we join in that presentation, supporting the points raised therein.

II. THE "RISK ANALYSIS" APPROACH PRESENTED BY CHESSIE SHOULD BE APPLIED TO THE SIGNAL AREA

A. Summary of Chessie's Regulatory Philosophy

At our presentation during the first FRA General Safety Inquiry, we set forth Chessie's "Risk Analysis" approach to rail safety detailing our views on how safety issues should be analyzed and how solutions to those problems should be developed. There we asserted our belief that there are six fundamental considerations that should be part of any rational approach. These are:

1. Identify the principal hazards or risks existing in the industry and list those hazards in order of priority.

2. Responses to the hazards or risks should be identified and analyzed by all interested parties. The following responses should be considered:

a. A regulation
b. No regulation
c. Performance standards
d. Economic incentives

3. Each response should be analyzed to determine:

a. Costs to the private sector, consumers, federal, state and local governments
b. Benefits to be derived
c. The extent to which it created unnecessary inflexibility and inefficiency
d. Reasonableness

4. When a particular response is selected, the FRA should discuss the advantages and disadvantages of the various alternatives rejected, and articulate why the particular standard adopted will best eliminate or reduce a particular hazard. The standard or regulation should be clear, precise and understandable to all who may be affected by it.

5. Every standard should be accompanied by an understandable method of measuring its effectiveness to enable the FRA to quickly rescind or modify standards which become outmoded or are not responsive to the problem they were designed to eliminate.

6. The regulation should be accompanied by an enforcement program designed to promote the objectives of the regulation.

The Secretary of Transportation has calculated that the railroad industry faces a potential capital shortfall of between $13.1 billion and $16.2 billion during the period of 1976-1985.[1] Accordingly, it is of the utmost importance that the FRA focus its attention on the most important safety problems — those where an analysis of accident data indicate that regulation is most needed — and would be effective — and that the approach adopted (whether it is a regulation, a performance standard, or no regulation) is the most cost-effective approach to resolving the problem. Since a performance standard or regulation can only be financed by limited or urgently needed capital, the need for, and the efficacy of, that

[1] — A Prospectus for change in the Freight Railroad Industry, October, 1978, page 65

Chessie System was represented by these men at the FRA safety inquiry (left to right): G. A. Costello, counsel; J. M. Beavers, program coordinator S&C; P. M. Giftos, counsel who gave testimony; and K. C. Morris, vice president engineering & maintenance.

standard or regulation must be beyond question[2]. It is obvious, but true, that a solvent financially viable railroad industry is going to be more able to compete with other modes and offer its employees a safe and desirable work environment than one that is facing imminent financial disaster. Since regulations add to costs, they must be clearly needed, no just "nice to have".

It is refreshing for Chessie to see that some of the concepts we and other railroads discussed last year (performance standards, economic incentive, economies of safety, effects on technological advance, risk analysis, etc.) are becoming part of the everyday vocabulary of the FRA and other regulatory agencies which are becoming increasingly concerned about the economic and inflationary consequences of government regulations. Regulations adopted with these concepts in mind are more likely to support the goal of increasing safety without burdening efficient railroading. However, before we can fully realize the benefits of "Risk Analysis," it is essential for us to learn early where the problems are and then list and respond to those problems in some prioritized fashion. Until a prioritized list of hazards is identified, we will continue to spend millions for programs having a limited return (highly visible markers — defined by the FRA as serving a "back-up" function — will cost the industry over $10,000,000) rather than concentrating our collective expertise on those areas where the presence of a regulation may have a signigicant positive impact on increased safety.

B. Examples of How Chessie's Risk Analysis Techniques Could Produce Superior Signal Regulations

1. The Technology of Signalization

Chessie in this proceeding as in past proceedings wishes to point out the existence of what might be called institutional inertia. No less an authority than Secretary of Transportation Adams has observed that Interstate Commerce Commission regulation was "designed for Nineteenth Century Robber Barons but [has] produced Twentieth Century Bankruptcies." (Wall Street Journal, Thursday, February 1, 1979, p. 8, col. 3). Existing FRA enforced signal regulations contained in 49 C.F.R. Parts 233, 235 and 236 may be traced back to ICC Docket Nos. 13413 and 29543. Docket 13413 dates from 1922 and Docket 29543 dates from 1947. Of course, there have been changes in these provisions over the years, but we believe technology has changed faster than the requirements currently applicable and the existing regulations largely reflect the thinking and philosophy of the ICC. Since existing signal regulations date from the time when the Interstate Commerce Commission (ICC) had jurisdiction over this area, perhaps the Secretary's well-publicized belief that ICC regulations are overly restrictive would be equally applicable to his own Federal Railroad Administration.

Chessie's regulatory approach is designed to permit regulations, even if they are design or maintenance standards, to rapidly respond to technological improvements. Point number 5 (page 4 supra) would require that every standard be accompanied by an understandable method of measuring its effectiveness. If the FRA regulatory program adopted such a system, then meaningful and necessary revisions could take place more frequently and the interests of safety would be advanced.

2. Some Specific Examples

Let us consider some specifics to illustrate our case more quantitatively. The test frequencies required by Section 236.106 and 236.108 were established before development of improved vital type relays, wires and cables. We are unnecessarily burdened with excessive cost involved in testing electrical operating values of relays on a frequency of every two years. In the forty years since the two-year test standard was propounded, there have been significant advances in technology. Relays are proven pieces of equipment; the regulations should be changed to comport with this fact.

There are two main uses of relays — vital and non-vital. A vital relay application is one which controls signals and various other safety related functions; a non-vital relay application is one where safety is not involved (e.g., lights on a track model board, which board is used for informational purposes not train control). We believe that the regulations should relate only to that universe of relays which affect signals and safety, and we also believe that regulations of this type should be as narrowly drawn as possible.

On Chessie, a change in this one rule, (extending the test period from two to five years) would result in approximately 2,491 man days per year being made available — days that might usefully be rescheduled for meaningful signal work. Not only would it be possible to perform meaningful work, it would be possible to save unnecessary expense. A reasonable average hourly rate for a signal maintainer, by no means the highest rate in the signal craft, is $8,75 per hour. In addition, employees are entitled to fringe benefits which currently approximate 34% of base salary. Hence, we derive a figure of $233,655 per year in superflous wage cost resulting from this test, calculated as follows:

2,491 days x 8 hours./day x $8.75	= $174,370
34% of above figure	= 59,285
	$233,655

It should be pointed out that there would be no displacement of workers, but rather a redeployment of workers to more essential tasks.

[2] — The economic problems facing the railroad industry are obvious. The inflationary impact of government regulations was the focal point of Appendix A of Chessie's June 14 presentation in Docket No. RSSI-78-5. There we compared rate increases granted by the ICC in the years immediately preceding and following the passage of the FRSA — emphasizing that the private sector ultimately "must find the revenues to satisfy this ever-increasing torrent of regulatory activity".

The insulation resistance testing required by Section 236.108 requires insulation testing every eight years and is another example of an unnecessary overly restrictive costly regulation which has not been revised to reflect increased technology. Insulation on wires has improved markedly with the development of new and more effective materials. Furthermore, completion of the test required by Section 236.2 (a ground test to assure that each circuit, the functioning of which affects the safety of train operations, is kept free of ground) will detect inadequate insulation.

Section 236.108 requires Megger testing of cables on an eight-year basis. This test should be extended to ten years and would result in both a saving of unnecessary labor cost and elimination of potential misconnection at the same time. To perform a Megger test, the cable to be tested must be uncoupled, the test performed, and the cable reconnected. Since new insulating materials have been developed and cables are longer lived than formerly, we believe the period for a Megger test could be extended without detracting from safety. This is also another example of an FRA "Safety" regulation which may do more to decrease than increase safety since the uncoupling and reconnecting required by this test presents frequent opportunities for human error — misconnecting the cables — when the test is completed.

Extending the Megger testing period required by Section 236.108 would result in approximately 240 man days annually being made available for working on meaningful safety improvements. The cost of this unneeded test is calculated as follows:

240 days x 8 hrs./day x $8.75	=	$16,800
34% fringe benefit factor	=	5,712
		$22,512

Chessie does not and cannot argue that the cost resulting from the continuance of these tests in the form presently required will constitute a financial disaster of the first magnitude. However, we can and do suggest that the vast multitude of regulations, of which these two are but examples, will, if continued, lead to serious problems. Surely, a financially weak organization cannot be as able to repair and renew safety equipment as a prosperous one. Is it better to fly in a new 747 or a patched-up DC-3? The answer is obvious, we believe.

III. MISCELLANEOUS CONSIDERATIONS

During the course of these five safety inquiries, certain issues have been presented which Chessie believes deserve additional discussion. Among these are the concept of "performance standards", and the role of government.

A. Performance Standards

The term performance standards has been extensively used throughout these hearings. Numerous parties, many of whom frequently disagree, have discussed performance standards and all appear to agree that they constitute a superior alternative to the more traditional

design or maintenance standard.[3] While all parties tend to use, or perhaps overuse, the term, there seems to be no common agreement on what the term means, and on numerous occasions members of the FRA panel have questioned participants about the term in an apparent attempt to comprehend more fully what it means. Chessie has repeatedly urged the adoption of "performance standards"; and since we will continue to advocate the superiority of those, as compared to the traditional design or maintenance standards, we will offer some additional explanation of what we mean by the term and how we can move toward performance-oriented standards.

1. "What is a Performance Standard?" Or, Stated Another Way, "What is the Role of the Federal Government?"

Performance Standards can, perhaps, best be explained by comparing and contrasting them with the current regulatory approach. The current approach for the most part is characterized by numerous design and maintenance requirements. Design or maintenance standards cast the government in the role of telling the private sector how to do something. They tend to be resistant to change and discourage technological advance since implementing changes require, as we pointed out in an earlier presentation, that the change negotiates the obstacle course of regulatory approval.[4] Performance standards, however, envision the government in an entirely different role. With performance standards the

[3] — In "A Prospectus for Change in the Freight Railroad Industry" (October, 1978) the Secretary of Transportation stated:

"Where feasible from the point of view of enforcing safety compliance, the substitution of performance standards for maintenance and inspection requirements may relieve the industry of strictures that have the effect of raising operating costs or impeding innovation." (page 52)

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government does not tell us how to do something, rather they articulate specific objectives and permit the individual carriers, which possess knowledge of their unique operations, to implement the appropriate program to achieve the desired result. By establishing goals rather than establishing maintenance or design standards with the hope they will produce a desirable result, the government encourages positive changes, it permits the carriers to deal more rationally with the system as a whole rather than as a single item, and places the government in a monitor and support role rather than simply a policing role.[5]

While analogy is not identity, a few examples may serve to illustrate our point. A client who desires an office building tells the architect what his needs are — how many square feet, what his intended use is and how much he wants to spend. The architect translates these into a plan for meeting the client's needs, the size and style being evolved from what the intended function is to be. If the Army needs a new tank or the Navy a new ship, the standards are established and designers then develop the machine to carry out the intended mission. Similarly, once we determine what is needed and feasible in railroad regulation, the carriers should be permitted to develop systems capable of achieving the mission. These systems may vary, just as a satisfactory house may be Federalist, ranch or split level; the result is the goal, not the means of achieving it.

[4] — Note: The FRA "lifting lug" requirements provide an excellent example of regulatory obstacle to a technological advancement.

[5] — There is really nothing new about this approach. As early as the 18th century, B.C. in fact, King Hammurabi had a simple building regulation that if a house collapsed and killed the occupant, the builder would be executed! The King and his advisers rightfully recognized that role of government is to establish goals rather than the means to reach the goals.

2. How Should Performance Standards Be Established?

Chessie believes that the most appropriate method to measure performance is through analysis of the accident-incident statistics. Chessie has stated that we believe that before the railroad industry and the FRA can work effectively toward improving safety regulations, we must learn exactly where the real problems exist. It is essential that the FRA should analyze national accident statistics to determine where we should focus our attention.[6] Once the list is established, the FRA can focus upon the real problems and determine what failure rate constitutes an acceptable level of performance. If a carrier's accident/injury data indicates that few injuries are properly attributable to locomotive problems, signal problems, etc., the need for FRA attention in that area would be minimal. However, if the data indicates that freight car defects, human error, etc., are frequent contributing causes of accidents, then attention should be directed toward those areas. The FRA would not be in the position of telling the carriers what to do with a specific component; rather they would tell the carrier what are the reasonable goals which we should attempt to achieve in relation to the operation of components.

The goal of all of us is, of course, the complete elimination of all accidents and injuries. However, the realities of the world have taught us that absolute safety is impossible and incompatible with society's other objectives such as control of inflation, maximum employment, etc. Accordingly, the acceptable level of performance established by the FRA must be reasonably attainable and compatible with other objectives. Hence, the level of performance accepted is, to a large extent, an economic decision since economics is nothing more than a study of choices: we accept some level of injury in order to fly, drive or manufacture. We must first determine what that level is and then focus our resources to achieve it.

3. Performance Standard and Signal Regulations

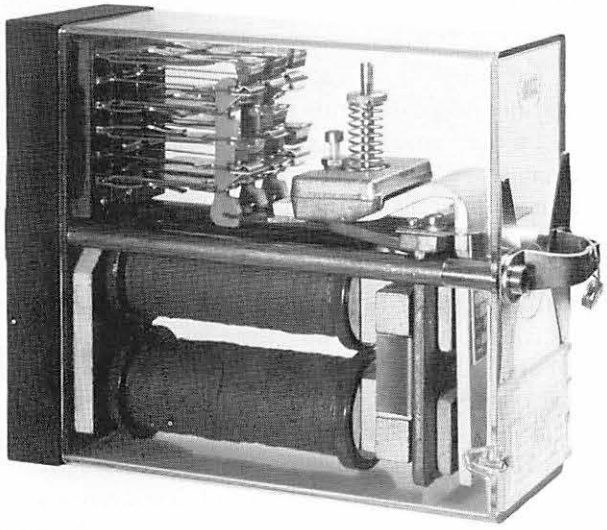
To focus our views about how performance standards should operate in the signal area, consider the following. The purpose of train signals is to give or deny permission to train crews to enter a given segment of track. In

[6] — The FRA has apparently started a systematic review of its accident data to help it evaluate the genuine safety problems and establish a prioritized list of safety improvement projects. In a report to the National Transportation Safety Board, it was stated:

"FRA reports that is has initiated an analysis of the potential cost benefits of fencing key portions of railroad rights-of-way, the findings to be incorporated in FRA's Hazards Analysis and Priority Determination System for comparative evaluation with other possible safety improvement projects. Conclusions will indicate whether fencing of railroad sites could be cost effective safety improvements . . . " (Federal Register, Thursday, December 14, 1978)

GRS
TYPE B BIASED-NEUTRAL RELAY

for highest reliability in pole-changed circuits



The GRS Type B biased-neutral relay picks up only when voltage of proper polarity is applied. Voltage of opposite polarity - even far in excess of that used in signaling circuits - cannot pick up the relay. Neither the magnitude nor the length of time the reverse voltage is applied affect the operating characteristics of the relay.

The biased-neutral relay is just one of over 25 different kinds of Type B relays available from GRS - each one with a variety of contact arrangements, coil resistances, and operating characteristics to suit your particular circuit requirements.

For more information about GRS Type B biased-neutral relays, and the complete line of GRS Type B relays, write for a copy of Pamphlet 1457.

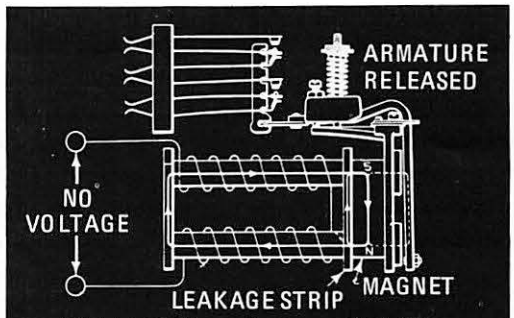


Figure 1. No voltage applied. The biased-neutral relay is deenergized. Most of the magnetic flux is in the U core structure.

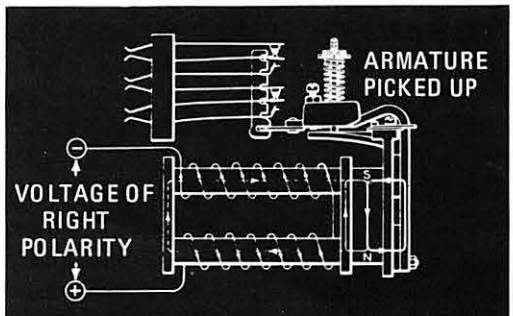


Figure 2. Voltage of right polarity applied. The armature picks up. Most of the magnetic flux is diverted through the armature because current through the coils has created high reluctance in the U core structure.

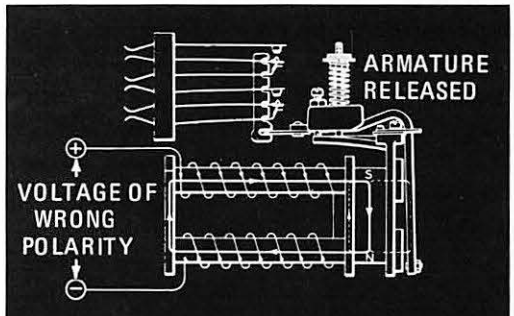


Figure 3. Voltage of wrong polarity applied. The armature does not pick up. Practically all the magnetic flux is in the U core structure as the current through the coils has created even lower reluctance in the U core than in Figure 1.

3713

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GENERAL RAILWAY SIGNAL
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ROCHESTER NEW YORK 14602

addition, when permission is given to enter, the crew also is advised at what speed it should operate. Hence, a train may be given permission to proceed at the maximum authorized speed for the relevant segment of track, or it may be, due to traffic or other conditions, that the rate of advance is held below the maximum for the track in question. We believe that so long as the signals in question do what they are supposed to do (which in this case is control traffic entry and flow), requirements about spacing, location, testing, etc., merely impede efforts to maintain and improve operations without yielding special benefit in safe operations. Hence, we believe that an application to improve an existing system is something which can be, at best, eliminated, and as a second option streamlined so that a carrier making an improvement coud advise the FRA of the contemplated action.[7]

Chessie believes that the current "fail-safe" design of signals favorably blends with the performance standard concept. If a signal system is designed, as discussed above, to control entry and traffic flow and does this in a satisfactory manner, then we approximate the performance standard concept of specifying results, not means of achieving results. If, as is the case, the signal system is also designed so that system malfunctions result in halting traffic flow because they fail to the most restrictive mode, then we have a system where technology and law work in harmony. Because this is so, Chessie believes that the material in Question Six[8] concerning additional redundancy is inappropriate. A fail-safe system cannot and, in our opinion, should not be designed on a redundancy basis. To do so is to develop a system which conceals failure. We believe it is more desirable to know that the system has malfunctioned, and to correct that malfunction, than to have additional costly superfluous redundancy which hides the fact there is a malfunction. When a component fails, we should be made aware of the failure and take steps to repair it.

Turning our attention to Question 23 gives us another example of how some current standards operate as performance standards even though they aren't labeled as such. Signal spacing is not determined solely on the basis of train stopping distances. In many instances the track configuration and location of power switches for operational reasons dictate where signals are located. There may be one or more power switches at two or more locations, and a signal at one group of power switches

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may not be located train stopping distance from a signal at another group of power switches. In this situation circuits are designed to provide sufficient aspects for trains to operate in compliance with signal indications by means of a brake application, other than an emergency application as required under present Section 236.24.

Consider the following example. Assume a line of railroad three miles long from point A to point C via point B, all points being equidistant: At A and C there are power switches protected by signals. Assume that between points A and C there is a need for a new power switch at point B caused by a new diverging route. The switch is installed and signals protecting it are erected. However, rather than rearrange the physical location of the signals prior to the new switch, we would design circuits for signals to display additional aspects so it would be possible to stop before arriving at the new switch. Hence, physical respacing of existing signals is not necessary so long as there are sufficient aspects displayed on signals to provide advance information for an approaching train to stop within the required distance.

As for the last portion of Question 23 ("There are no industry-wide standards for train stopping distances. Should FRA establish uniform standards to assure that signals are adequately spaced?"), the answer is "NO". The provisions of Section 236.24 are adequate as presently written to provide safe signal systems and require that signals be spaced "so that the indication of a signal displaying a restrictive aspect can be complied with by means of a brake application, other than an emergency application . . . ", etc., thus establishing a goal rather than specifying how to comply with a desired result.

Each railroad has developed braking distance requirements to meet the transportation and operational needs of its own railroad. These requirements vary from one railroad to another due to physical terrain, type of trains operated, (short fast freight trains on some railroads, long heavy coal trains on another, or a mixture of passenger trains and freight trains operating on the same

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[7] — Chessie has examined its accident incident data back to January, 1972, and found that no accidents were attributable to signal failure, except from one instance in November, 1978, which resulted from vandalism or deliberate sabotage.

[8] — References to "questions" herein refer to the questions of the FRA which appeared in the December 12, 1978 Federal Register.

line), density of traffic, authorized speeds, train handling procedures and practices such as train line brake pipe pressures, how brake applications are to be made, full service or reduction in steps of a certain number pounds each, grade and curvature of tracks and other factors which affect train stopping distances.

Railroads should have the prerogative to establish their own operational requirements which, in turn, will influence stopping distance requirements. Operating patterns must change and regulations should not prevent needed changes, simply because longer, heavier trains are operated on a track where a signal system is in service that was originally designed for shorter, faster trains requiring shorter stopping distances, does not mean that it is necessary to physically relocate signals to provide different or new stopping distances. The required stopping distance can be accomplished by (1) reducing authorized speed for the longer, heavier trains so they can stop in the same distance as a shorter, lighter, faster train, or (2) redesign of circuits to provide additional aspects to provide two or more blocks for stopping distances.

There is no justification for having an industry-wide standard for train stopping distances just for the sake of having more regulations. Safe signal systems are the goal; and as long as the provisions under present Section 236.24 are met, that is, "so that the indication of a signal displaying a restrictive aspect can be complied with by means of a brake application", train stopping distances will be adequate and safe.

B. The Role of the FRA

As stated earlier, Chessie believes that the role of the government in railroad safety should, in part, be one of monitoring and supporting the industry in a mutual effort to reach realistic goals. This role would encourage federally financed analysis and research to help the industry identify and respond to genuine problems.

Chessie believes problems associated with the safety of signal systems indicate an additional area where the FRA could offer significant assistance. Chessie would encourage the FRA to promote and support stronger legislation than now exists to deter vandalism on or near railroad property. While this is true with respect to all aspects of rail operations, it is especially true with respect to signal apparatus. Since signal gear is composed of valuable materials such as copper wire, lead in batteries, semaphore blades, it presents a tempting target for thieves. In addition, there are numerous instances of simple, mindless, destructive vandalism — the sort where signal lenses are shot out, instrument bungalows are perforated by gunfire, etc. This type of vandalism is, regrettably, illogical and defies the efforts of sane railroad officials to take totally effective preventive action since logic is useless when matched against the illogic of madness. We have, of course, taken the obvious steps: the use of unbreakable Lexan in signal lenses, the application of special locks where appropriate, and the use of boilerplate to "armor plate" instrument bungalows where random sniping has been a problem.

We believe that railroads do not need more regulations to resolve the vandalism problem but rather since it is a social problem, we need society's help. A strong federal statute addressing the problem supported by the FRA may be a useful tool in deterring this destruction.

Although there are many State laws covering the general area of vandalism and malicious destruction of property, it is difficult to secure continual attention from local and State authorities. This is not to disparage their efforts, but rather simply a reflection of the current state of social organization. Crimes such as rape, robbery and murder require the concentration of law enforcement resources, while other areas of anti-social behavior receive less attention. We believe that the addition of a federal statute covering the subject to our arsenal to be a worthwhile goal upon which all concerned — labor, management and the Government — can agree.

J. S. Downs (right), general superintendent communications & signals, St. Louis-San Francisco, presented testimony at the FRA safety inquiry. Associated with Downs at the hearing was Thomas H. Mug (left), attorney at law.

Frisco comments on signaling at FRA safety inquiry

My name is J. S. Downs, and I am appearing in behalf of the St. Louis - San Francisco Railway (Frisco) in this public hearing concerning signal and train control systems. My position with the Frisco is general superintendent communications and signals. I have served 29 years with the Frisco, all service being in the communications and signals department. Among other duties, I have overall authority and responsibility for the Frisco's signal system.

The Frisco has 1,447 track miles of CTC, 437 track miles of ABS territory, and 2,740 track miles of timetable — train order. We have approval to convert 313 track miles of ABS territory to centralized traffic control, which is underway.

First, when FRA considers the revision, application or construction of S&TC regulations and orders, it must not overlook the fact that the carriers' operating rules

complement and supplement those regulations and orders. Of what value is a signal displaying any aspect if there is no operating rule which defines the action to be taken? I am not in any way advocating that FRA issue operating rules. My point is that application and interpretations of S&TC regulations must recognize that operating rules have force and effect, and cannot be ignored by the FRA as is sometimes done in the application and interpretations of regulations and orders.

Second, it is difficult to understand why a carrier is required to file an application to upgrade a signal system. Any signal system must comply with the rules and regulations. Why burden the carrier and the FRA with unnecessary delay and paperwork? I recommend that FRA eliminate the need for filing applications for upgrading of signal systems.

Third, FRA processing time for applications is continuing to degenerate. Recent applications we submitted required the following times:

BSAP 1281, 1412, 1413 and 1284 each required 6 months for approval, BSAP 1286 required 7 months, and BSAP 1229, required 4½ months.

There was nothing controversial about these applications. In each case, the labor organizations fully supported our requests, and had so advised the FRA.

In addition, the regional FRA offices were furnished copies of the applications which they handled promptly. Apparently the delays occurred in FRA's offices in Washington.

Such application delays handicap the carrier's efforts to upgrade signal systems. Most carriers authorize their capital improvement budgets toward the end of the year in which the funds are to be allocated and spent. Funding usually is allocated, based on how much can be spent in the fiscal year. If the allocated funds cannot be spent in that year, they are carried over into the next year with the total capital program reduced for that year by the amount of the carryover. Just as the various government agencies contend with each other for budget monies, so do the various departments of the railroad. Projects are approved on the basis of the benefits to be derived and the time frame to accomplish the project. With the lead time required for material and manpower, all delays must be kept to a minimum, and a six-month delay in obtaining approval from FRA can severely handicap the upgrading of signal projects. FRA needs to seriously re-evaluate the need for, and the time required to process applications.

Fourth, the requirement for electric locks in Section 236.314 and 236.410 should be eliminated. Electric locks are not required under Sub-Part "B" of the RS&I — how then can they be justified and required for Sub-Part "C" or "D"? Elimination of 236.314 and 236.410 will not reduce safety of train operation. It should be remembered that in traffic control systems, trains using hand-throw switches do so under authority of the dispatchers in accordance with the operating rules. Usual procedure is to issue "Track and Time" limits to the crew of the train which permits the use of a certain portion of trackage for a given period of time. Signals protecting this segment of track are positioned to "STOP". Within those limits the train moves at restricted speed, using trackage and switches as necessary.

A train not operating under "Track and Time" limits in a siding or spur equipped with a hand- operated switch with or without an electric lock must obtain permission from the dispatcher to open the switch. Electric locks are costly and contribute heavily to the cost of a CTC project. As an example, on a recent installation of CTC on 92 miles of track, 15 electric locks were required at a cost of $195,000 or 20 percent of the total cost of field installation. We have two CTC projects underway, one of 132 miles requiring 23 electric locks at a cost of $322,000, or 13 percent of the total field installation. The other is a 181-mile project requiring 44 electric locks at a cost of $607,000 or 24 percent of the cost of the total field installation. We have been trying to get these projects approved for the past 20 years. Sufficient savings could not be realized to justify the cost of these projects until recently when new technology provided savings in other areas not available in prior years. Had the requirement for electric locks not been in effect these projects could have been justified years ago. The $1,124,000 spent on these electric locks could have been used to upgrade existing signal systems or provide additional miles of signalled territory.

The requirement for electric locks in CTC territory is also a severe handicap in attracting new industry to locate along the carrier's trackage. Many of the industry tracks for prospective customers would be of sufficient length to permit a train to clear for a main line move, and this would require an electric lock. A speed restriction of 20 mph over the switch would not be operationally acceptable since main line operation would be severely handicapped. The cost of the electric lock added to the cost of the switch, turnout and industry trackage has and will in many instances sway the prospective industry to locate elsewhere and/or patronize the trucking industry.

It is my opinion that Sections 236.314 and 236.410 should be eliminated from the RS&I in accordance with the recommendations submitted by the AAR C&S Section.

Fifth, it should not be necessary or required that modifications of signal systems require FRA approvals. Such changes as removing an interlocking facility and replacing with electric locked gates, replacing a power switch with a spring switch or a hand-throw switch, adding or removing signals to an existing signal system or changing the limits of a signal system to accommodate operational needs such as entrances to yards to provide lead room, etc., are not changes which are going to adversely affect safety of train operation. Any changes such as those must meet RS&I requirements. Give the carriers some freedom to operate their systems in an economical and effective manner, and eliminate the unnecessary applications for approval.

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In question 10, reference is made to "A material modification includes, but is not limited to, changes in the type of signal system, respacing involving removal of signals for reduction of maintenance costs — ". The number of signals that a carrier chooses to use is based on the "headway" they wish to maintain and if following moves, in fact, are desired. This is determined from the traffic to be handled, and will vary through the years. If a carrier desires to operate with less or more signals, with due consideration to its operating requirements, it should be permitted to add or delete signals in the signaled territory as it sees fit. Whether the carrier desires to operate with one minute or one hour of headway is a managerial judgment, and regulatory limitations restricting that ability cannot be justified by FRA. Neither can FRA justify a position that a "reduction in maintenance cost by removal of signals" is a material modification.

I concur with AAR's position that application be required only for system discontinuance. Upgrading of a system or changes within that system would not require application.

Sixth, Section 236.106 requires that "Relays in service, except locomotive relay, shall be tested once every two years". The improvement in relays and historical experience with relays has proven that a two year test period is much too frequent. We have many relays in service in excess of 25 years still within their operating specifications. Numerous relays are over 30 years of age still meeting their test requirements. These relays are in various signalling systems. Relays in locomotive service are in more severe service than relays in wayside signal service. Section 236.589 for locomotive relays permits a 4-year test period, yet 236.106 is more stringent. Based on experience to date, I recommend that the test period required in Section 236.106 be extended to 5 years, which I consider conservative. This would be a more realistic test period, and would not detract from safety of train operation.

Seventh. In regard to the question "Should there be specific Federal requirements concerning the qualifications of railroad personnel who install, maintain and test S&TC systems", my answer is "No, absolutely not". Qualification of employees in the field of signalling or any other area of the railroad industry is an exclusive carrier's prerogative.

Considerable effort and expense on the part of the carriers has been and is being expended to provide training facilities and programs to educate signal employees in the theory and practice of signalling. The Brotherhood of Railroad Signalmen and the carriers have mutually cooperated in this training effort by implementing agreement rule changes to provide for training. Mutual cooperation between carriers on the exchange of training information materials and techniques is continually in progress. Much credit for todays signal training programs in these United States must go to the Canadian National Railways whose programs and training materials were so willingly shared with us.

The purpose of these training efforts is to provide qualified signal employees in the industry. It has been and is working well and I can see no reason or necessity for FRA to set up qualifying regulations for signal employee qualifications. Further I do not believe that the federal government has a constitutional or legal right to establish such qualifying regulations. Federal intervention in this area is neither desired nor is it needed.

Eighth: Question 17 concerns Section 236.11 and addresses the alleged problems of interpretation concerning the meaning of the words "undue delay". The hearing examiner expressed clearly and meticulously the interpretation and meaning of this rule in the public records of Ex Parte 171. There is no misunderstanding of the meaning of the words "undue delay" by the carriers. It would appear that the concerns expressed by some are motivated to elicit an interpretation to provide a vehicle for requiring additional overtime for employees in situations where safety of train operations is not required during penalty hour periods.

In FRA's "Discussions and Findings — Rule 136.11" the explanation and interpretation of the term "without undue delay" was presented as follows: "Stated very simply the main purpose of the change substituting 'without undue delay' in place of 'promptly' is to clarify the situation respecting repair of signals at overtime rates during other than normal duty hours, particularly on weekends and at night time. Stated with equal simplicity, it is the intent of this part of the rule that repairs or adjustments be made before the next movement is made over the line. Should movement times require night time or weekend repairs, then they must be made. On the other hand, should the defect occur on Friday night and there is to be no movement on line involved until Monday at 11:00 AM, then the repairs made at anytime prior to the movement at 11:00 AM on Monday would be made without undue delay. With the admonition that the phrase "without undue delay" be interpreted and given the effect above indicated it is found to be in the best

interest of our administration of this rule and in the best interest of safety, it shall accordingly be included in the changes herein adopted".

FRA further states: "We find that the record does not support a rule which would require that repairs be made before the next movement in all situations. Such a rule would be unduly restrictive since adequate temporary safety measures can be taken until the necessary repairs are made. We further find that the phrase "without undue delay" is a reasonable provision considering the infinite variety of factual situations in which rule 11 is applicable".

In view of the above interpretations by FRA, I can see no valid reason to amend Section 236.11 to specify when repairs and adjustments must be completed.

Since the wording of "without undue delay" was added in Section 236.11, a further roadblock in complying with this rule has been the Hours of Service Law extended to cover signal employees. The nearest employee cannot always be called to respond to signal trouble due to not being properly rested. This Hours of Service Law covering signal employees works at times at cross purposes with the Signal Inspection Act. On our property, the majority of the signal employees did not ask nor did they want to be covered by this law. It is difficult to understand why Congress would pass such a law that restricts an employees ability to gainfully work and earn compensation. With this law, delays are often encountered while awaiting the employees completion of his required rest period. Even with this delay, the employee is usually the nearest to the trouble in point of time to correct. At other times some other employee further removed must be called.

Reference is made in the question to the term "false restrictive". I take exception to that term. Signal systems are designed to present restrictive aspects under conditions of train occupancy and under conditions not involving presence or operation of a train on the track governed by the signal. Restrictive signal aspects other than desired are investigated in accordance with the provisions and interpretations of 236.11. This is as a practical matter required if it is intended to operate trains meeting schedules and competition.

Ninth. The AAR C&S Section has prepared and submitted suggested revisions of the RS&I, The Frisco fully subscribes to and supports those proposed revisions. I wish to state at this time that if all of those suggested revisions are adopted by the FRA, I would have no intention of reducing our signal maintenance force on the Frisco. Finally, I wish to commend FRA's Maintenance of Way Division Chief W. R. Paxton, Signal and Train Control Specialists S. H. Stotts and D. M. Preston for their excellent work in the preparation of the "Technical Manual for Signal and Train Control Personnel". The explanations and interpretations contained in this manual will be an excellent reference source to insure that the laws and regulations will be administered uniformly and equitably on all railroads. I would recommend that this manual be made available to all signal engineers and the officials of the Signalmen's organization.

Frisco answers FRA questions

1- Factors in revising regulations.

The purpose of the S&TC regulations and orders is the achievement of safety of railroad operations. In light of this purpose, what are the principal factors which FRA should consider in revising them?

I suggest the following:

(1) Is there a definite proven need for the regulation or order?

(2) Is the present rule or order obsolete because of different operating conditions, new technology or practices?

(3) Can the regulation or order be complied with without undue or unnecessary burden to the Carriers, either from an operational or financial standpoint?

(4) Does the regulation or order enhance the Carrier's operating rules and/or recognize that the Carriers' rules are essential to the operation of a signal system?

2- Minimum requirements.

The S&TC regulations are intended to be minimum safety requirements. Do "minimum requirements" encourage lower levels of inspections, maintenance, testing, or repair of signal systems?

ABSOLUTELY NOT! As an example, on our property we require more frequent inspections and tests for certain equipment and circuits than required by RS&I. Examples are:

236.102 We require inspection each month versus RS&I's 6 months.

236.103 We require inspection and test each month versus RS&I's 3 months.

236.104 We inspect and test each month versus FRA's 6 months.

In addition, we require other inspections and tests not required by the RS&I.

3- Regulations and change.

Do the existing regulations deter either the upgrading of existing signal systems that are obsolescent or obsolete or the initial installation of signal systems?

Yes. Certain of the regulations do indeed not only hinder upgrading or initial installations, but in addition handicap the railroad in its ability to attract new industry to locate on the railroad.

First, the requirement that an application be filed to *upgrade* a signal system is asinine. Why is it necessary to seek permission to upgrade an overlap block signal system or APB to a Traffic Control System, etc? Those systems must meet RS&I requirements, so why is it necessary to request approval?

Second, the processing time for such approvals as

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above is unnecessarily long. Recent requests for approvals are as follows:

BSAP 1282 — 6 months
BSAP 1412 — 6 months
BSAP 1413 — 6 months
BSAP 1284 — 6 months
BSAP 1286 — 7 months
BSAP 1229 — 4½ months

In each case the labor organizations fully supported our requests and so advised the DOT. Such delays have an adverse effect on the Carriers' attempts to upgrade systems. Most Carriers authorize their capital improvement budgets toward the end of the year preceeding the year in which the funds are to be allocated and spent. It is mandatory that the amounts authorized for that year be consumed; otherwise, the project is carried over and the total capital program of the next year is reduced by the amount of the carryover. With the required lead time for delivery of signal material and buildup of work force, time is of the essence. A six month delay in obtaining approval from the FRA can seriously handicap the upgrading of signal systems.

Third. Rule 236.410 requires electric locks on certain switches. On three of our recently authorized CTC projects, these electric locks contributed the following costs to the CTC projects:

ASH GROVE SUBDIVISION: The project length was 92 miles. There were 15 electric locks required at a cost of $195,000. or 20 percent of the total field installation.

ST. LOUIS SUBDIVISION: The project length was 132 miles requiring 23 electric locks at a cost of $322,000. or 13 percent of the total field installation.

CREEK – SHERMAN SUBDIVISION: The project length was 181 miles requiring 44 electric locks at a cost of $607,200. or 24 percent of the total field installation. We have been trying to justify these projects for the past 20 years. We were unable to obtain sufficient savings to justify the cost of the projects until recently when new technology provided savings in other areas not available in prior years. Had the requirement for electric locks not been in effect, these projects could have been justified in prior years.

Additionally, we receive numerous requests for industry track estimates by prospective customers. Many of these tracks would be of sufficient length to permit a train to clear, and thus by today's regulations would require an electric lock. A speed restriction of 20 MPH would severely handicap through freights. The cost of the locks to the industry in many instances sways their decision to patronize the trucking industry.

In my opinion, the requirement for Rule 236.410 should be eliminated. How can the FRA realistically substantiate the need for electric locks? They are not required under "Sub-part B" of the RS&I; how can they be required for "Sub-part C" or "D"? Elimination of the requirement would make more dollars available for improving and adding signal systems. It would also be an asset in attracting new industry to the railroads.

Fourth, another area which also is of great concern in the administration of the Signal Inspection Acts involves the extreme difficulty experienced by the Carriers to obtain permission to remove obsolete or unneeded signal systems. It must be recognized that operations and traffic patterns change through the years. It should be a Carrier's prerogative to eliminate and retire unneeded systems to meet their operating criteria and objectives without necessity of approval from the FRA. There are many miles of timetable-train order territory operated safely today, and a Carrier should have the unobstructed right to operate in that mode if he so chooses.

4- Regulations and flexibility.

Are the existing regulations sufficiently framed as performance standards so as to encourage technological development of S&TC systems, devices, or apparatus? How could the regulations be made more flexible to allow for greater technological innovation without detracting from safety?

I believe the regulations are adequately constructed so as not to inhibit technological innovation. It would be extremely difficult to establish regulations designed to promote technological innovation with sufficient latitude to encompass future unknown technology.

5- Personnel qualifications.

There are currently no specific Federal requirements concerning the qualifications of railroad personnel who install, maintain, and test S&TC systems. Should there by such requirements, and if so, what should they be?

Absolutely not! The qualifying criteria for all railroad employees is a management prerogative. The Government has no constitutional or legal right to usurp that prerogative. In recent years there has been increasing emphasis on training of signal employees throughout the nation. The Carriers and the Brotherhood of Railroad Signalmen have cooperated in this training effort through agreement rule changes and in other areas.

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Federal intervention or involvement is neither desired nor needed.

I would suggest that FRA continue to exert its efforts in the training of its Inspectors, particularly the newer ones, in the uniform interpretation and administration of the RS&I. It is my understanding that considerable effort has been directed in this area.

6- Vandalism areas?

In many areas, one of the major causes of signal problems is vandalism. Should additional circuit redundancy or other protective measures be required in areas with a high incidence of vandalism?

Of far greater benefit would be the joint legislative effort on the part of the FRA, RLEA and the Carriers to seek stiff Federal penalties against anyone tampering with signal systems. Further, some way must be developed to insure that the courts do punish such individuals and not release them on some technical detail. FRA regulations are not the answer and would only be an additional costly burden without solving the problem.

7- ICC order on train control.

In 1922, the ICC issued Order No. 13413 requiring the installation of automatic train control devices over segments of the lines of certain railroads in accordance with prescribed specifications. Over the years, many railroads have obtained relief from some of the requirements of this Order.

(a) Since many of the requirements of the Order are now included within the RS&I is there any need to continue the Order as a separate docket?

(b) If the general requirements of the Order are incorporated in the RS&I, what provision should be made concerning relief from specific requirements granted to individual railroads?

Order 13413 should be vacated or abandoned.

8- Where signals required.

In 1947, the ICC issued Order No. 29543 requiring the installation of a Block Signal System on any portion of railroad over which passenger trains are operated at speeds of 60 or more miles per hour or freight trains are operated at speeds of 50 or more miles per hour and the installation of an automatic trainstop, train control, or cab signal systems on any portion of railroad over which trains are operated at 80 or more miles per hour.

(a) The FRA is considering incorporating the requirements of the Order in the RS&I. Is there any reason this should not be done?

(b) Are the speed restrictions adequate in today's operating environment? What other factors, if any, should be considered in determining whether signal systems are required to assure safety? For example, taking into account present operating conditions such as longer trains carrying more hazardous materials, should the maximum speed at which freight trains may operate in non-signal territory be changed?

(c) Should the maximum speed at which trains are permitted to operate in other then automatic trainstop, train control, or cab signal territory be changed?

(d) Should automatic train control be mandatory above certain speeds or under certain other circumstances?

(a) If the provisions of Order 29543 are to be continued, then they should be included in Part 236.

(b) Speed restrictions contained in order 29543 are adequate and closely complement the FRA operating speed limits for track classes above Class 3. With the extensive use of end-to-end, point-to-train and train-to-train radio communication plus the many installations of hot box and dragging equipment detectors, and with more frequent inspection of trackage by rail-flow detector cars, as well as track geometry cars, the overall safety of train operations has been enhanced considerably above what it was when Order 29543 was issued. Insofar as the operation of longer trains carrying more hazardous materials in either signalled or non-signalled territory is concerned, I see no reason to impose greater speed restrictions than those that are now permitted. A train should be allowed to proceed at the speed authorized by the Carrier with full consideration of the FRA class of track and the type of signal system involved, if any.

(c) No. See response to (b) above.

(d) No. Judgment on whether ATC is required above certain speeds should be the Carrier's prerogative to exercise, and not a mandatory regulation.

9- Reporting requirements.

One of the requirements of Part 233 is the immediate reporting to FRA of each accident caused by the failure of any S&TC device. FRA recognizes the need to revise this requirement to conform to the Accident/Incident Reporting Requirements of 49 CFR Part 225. What other changes, if any, should be made in reporting requirements of Part 233?

Since Part 225.9 requires a telephone report to FRA for accidents involving death or injury, there is, there-

fore, NO reason or NECESSITY for the report covered by 233.5. The Part 233.7(a) will adequately cover. In addition, the requirement of 233.7(b) should be eliminated. Section 233.11 provides a penalty for the Carrier failing to report. It is my recommendation that part 233.5 and 233.7(b) be eliminated.

10- Discontinuance or material modification

Part 235 prescribes requirements and procedures for obtaining FRA approval prior to discontinuance or material modification of a signal system under paragraph (b) of the Signal Inspection Act. Although Part 235 specifies certain changes for which aproval is not required, there are still a large number of applications for approval of changes that would result in equivalent or improved safety. To avoid unnecessary paperwork, delay and expense, there appears to be a need to develop criteria to allow additional changes without FRA approval.

The current working definition of the term "discontinuance" is the cessation of an S&TC system on track that remains in service for any railroad operations. A "material modification" includes, but is not limited to, changes in the type of signal system, respacing involving removal of signals for reduction of maintenance costs, conversion of a power-operated switch or derail to one operated by hand or spring, and any series of discontinuances or modifications which do not individually require FRA approval but will eventually result in a change requiring FRA approval. What changes, if any, should be made as to what constitutes "discontinuance" or "material modification" of a signal system?

This was addressed in part in my response to Question 3. It is my opinion that a Carrier who has voluntarily installed any of the systems covered in Part 235.2 should be permitted to remove or modify such systems as a managerial prerogative without necessity of approval from FRA. As covered in response to Question 3, traffic patterns and operating requirements change through the years, and the Carrier must have the freedom and ability to alter its facilities rapidly without seeking permission to do so from a Regulatory Agency.

It seems to me that Part 235 needs to be modified to permit a Carrier to remove or modify its signal systems in part or in whole without FRA approval.

11- No prior approval

FRA recognizes that some situations such as derailments and abandonments make prior approval of "discontinuances" or "material modification" impracticable or unnecessary. Section 235.3 lists those circumstances in which prior approval is not now required.

(a.) Are there other situations in which changes in signal systems should be permitted without prior FRA approval? What, if any, measures should be required to assure safety if prior approval is not required?

(b.) What methods other than track circuitry could be used to provide protection on light density lines?

(c.) The removal of any signal in an S&TC system is prohibited except to provide adequate stopping distances. Are there other circumstances in which removal of individual signals should be allowed without prior approval?

(d.) Temporary or permanent signal arrangements are permitted without FRA approval if they are necessitated by rail-highway grade separations or catastrophic occurrences. Increasingly in such instances, railroads establish "permanent arrangements" that in actuality constitute "discontinuances". Should railroads be required to report all catastrophic and other occurrences that result in removal of any portion of an S&TC system for a specified period of time? Should an approval procedure be required for all arrangements that are continued past a specified time?

(a) My position is as stated in response to Question 10 above, that the Carrier should not be required to make applications for discontinuance or modification.
The answer to the second part of the question is compliance with RS&I for systems retained and operation with timetable-train order for those systems removed.

(b) If the intent of the question is a system similar to a signal system, I know of none. If the question is directed at other methods of operation, then I would reply "Timetable-Train Order".

(c) Same response as the first part of (a) above.

(d) Same response as the first part of (a) above.

12- Other application data.

Sections 235.11 and 235.12 specify the contents required applications for approval.

(a.) Should other data, such as circuit plans, be required? Should any of the present data requirements be reduced or eliminated?

(b.) Should the starting and completion dates for the proposed changes be included in the application? Should each approval be conditioned upon completion of the change within a prescribed period following the scheduled completion date?

(c.) In what circumstances should an application that does not contain all of the required information be accepted and processed?

I have stated my position concerning applications in Question 10 and 11; however, I will respond to the questions:

(a) NO. Circuit plans should not be required because they usually have not been prepared at this stage. I know of no other data which would be of benefit in a decision.

(b) NO! How could a starting date be shown when there is no way to know when the FRA would approve. A completion date would not be of much benefit due to material deliveries and manpower requirements. The constraints on the capital expenditures would also affect the completion date. A certain way to get the jobs completed is to get approvals from FRA granted in a more timely manner.

(c) It would seem appropriate for the FRA to advise the Carrier when the omissions are discovered and

request the amended information to permit proceeding with the application consideration.

13- Federal Register publication

Notices of applications for approval of material modifications are mailed to each individual or organization that has requested inclusion in a central mailing list. Should these notices be published in the Federal Register instead?

If Part 235 is retained, then I say "Yes", post the Notice in the Federal Register and discontinue the central mailing list. Any protestant or proponent should be directed to furnish the applicant a copy of the comments which they submit to FRA.

14- Waiver from requirements of the RS&I

Are certain requirements of the RS&I of such importance to sound signal engineering principles that applications for waiver should require a greater showing of need for relief? Should additional proof of safety, such as a safety analysis of the proposed system, be required in these cases?

If the present regulations are carefully, objectively and unbiasedly reviewed and modified or eliminated where required, and in additon, if they are uniformly interpreted, then there should be few if any waivers requested. Any rule which continually attracts requests for waivers should be carefully reviewed to determine its value and need. In any event, any request for waiver should stand on its own merits and objective, thorough, unbiased analysis should suffice to make a determination for approval or denial.

15- Plans

Section 236.1 specifies that plans for signal systems should be legible and available for use at designated central locations.

The territory for which a signal maintainer is responsible may be extensive. Hence, a trouble call may arise at some distance from where plans are kept. Is there a need to require the plans to be kept at more accessible locations?

It appears to me that where plans are kept is a prerogative and managerial decision of the Carrier. Plans are kept where they are needed and can be referred to as required. Presently we maintain plans in compliance with Part 236.1 as well as at other locations not required by 236.1. I can see no valid reason to stipulate by regulation where plans are kept.

16- Changes on plans

During changes in signal systems, circuit changes are marked in color or symbolically. Should use of plans so marked be permitted subsequent to the completion of the changes?

YES. The marking in color or symbolically of prints to reflect circuit changes has been used for many years. Such markings have the same authenticity as a corrected print. It is not uncommon to have more than one color

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date on a print due to subsequent changes having been made prior to final print correction. There is nothing unsafe about such practice, and the Carrier should not be penalized for multiple color dates or for the length of time such color dates have been in existence prior to issuance of a corrected print.

17- Repair without undue delay

Section 236.11, which was issued in its present form by the ICC in 1966, has been the source of considerable controversy. Section 236.11 requires that "when any component of a system or interlocking, the proper functioning of which is essential to the safety of train operation, fails to perform its intended signalling function, it shall be adjusted, repaired or replaced without undue delay." Subsection (e) of the Signal Inspection Act provides in part: "It shall be unlawful for any carrier to use or permit to be used on its line any system, device, or appliance covered by this section unless such apparatus, with its controlling and operating appurtenances, is in proper condition and safe to operate in the service to which it is put, so that the same may be used without unnecessary peril to life and limb. . . . "

Problems of interpretation have arisen concerning the meaning of the words "undue delay." In general, FRA has taken the position that immediate action must be taken to assure the safety of train operations, but that adjustment, repair, or replacement of components may sometimes be deferred for a short time until parts of personnel are available. That is, FRA has recognized that temporary additional safety measures may permit traffic to continue over the line prior to completion of the necessary repairs and adjustments. However, in some cases any delay is "undue", and immediate repairs must be made.

a. How should section 236.11 be amended to specify when these repairs and adjustments must be completed?

b. Should explicit time requirements be set forth for correction of various categories of signal failures?

c. In view of the fact that a "false restrictive" indication could be caused by a ground or a broken rail, should

railroads be required to investigate immediately each "false restrictive" indication and to take appropriate remedial action?

d. What is the current practice of individual railroads concerning the investigation and correction of "false restrictive" indications?

e. Should Section 236.11 address system failures, as well as component failures?

(a) I see no reason to amend Section 236.11 to specify when repairs and adjustments must be completed. The intent and meaning of the rule is clear and FRA's interpretations are understood as expressed in the Hearing Examiner's public records in Ex Parte 171.

(b) This would be extremely difficult to do since there are so many variables which would have to be considered, most of which would be unknown until the particular incident occurred. It is not practical, nor is it necessary to set forth explicit time requirements to assure safety of train operation.

(c) First, the use of the term "False Restrictive" indication is incorrect. Signal systems are designed to present restrictive aspects under conditions of train occupancy and under conditions not involving presence or operation of a train on the track governed by the signal.

Secondly, my answer is NO. Operating rules govern conditions when a train encounters a restrictive signal and safety of train operation is not reduced or in jeopardy. Section 236.11 does not need amending.

(d) We comply with the clear intent and meaning of Section 236.11.

(e) The question is academic. When Section 236.11 is complied with, it follows that the system failure will be corrected when the component failures are corrected.

18-21 Solid-State Equipment

Technological advances have resulted in widespread use of electronic equipment of the solid state type in S&TC systems. There are no FRA regulations that specifically address this equipment.

18. *Should FRA prescribe performance standards for solid state equipment used in S&TC systems?*

NO. Since RS&I sets forth performance standards for signal systems and not for the component parts, there is no need to attempt to prescribe performance standards for solid state equipment. With the rapid improvements and advantages continually being made in solid state technology, it would be an impossible task for FRA to keep performance standards for such equipment current so that such technology could be applied in a timely and cost-effective manner.

19. *Should FRA require a safety analysis of all solid state equipment?*

NO. The manufacturers and users of signal components and equipment are in the best position to analyze either conventional or solid state equipment. They work jointly through the AAR Communication and Signal Section to develop specifications and requisites for signal equipment with safety of operation the foremost consideration for equipment used in vital circuits. The record speaks for the success of this mutual achievement.

20. *Section 236.8 requires that electromagnetic equipment be maintained within the limits in which it is designed to operate. Should this requirement be extended to solid state equipment?*

NO. Good engineering practice and common sense would require any piece of equipment to be operated within its design limitations to achieve the end result desired. Since RS&I prescribes performance standards for signal systems and not for components, this should be sufficient also for solid state equipment.

21. *What, if any, inspection and testing requirements should be prescribed for solid state equipment?*

None additionally. Solid state equipment should however, perform its function in the signal system in accordance with the appropriate RS&I requirements.

22-24 Roadway Signals

22. *A large number of the requests for waiver of requirements of the RS&I involve placement or roadway signals (Section 236.21). Many of these waiver requests are granted because the prescribed placement of signals to the right of track is often impractical or not required for safety of operations. How can this placement requirement be changed to eliminate the need to file those waiver requests?*

Quite simple. Revise the rule to read — "Each roadway signal shall be positioned and aligned so that the aspect it displays can be clearly associated with the track it governs." There should be no restriction on the use of left-hand signals on two main signaled tracks or on a main track with a siding whether the siding is signaled or not.

23. *The spacing of roadway signals (Section 236.24) is based upon braking distances of maximum tonnage trains operating at track speed. There are no industry-wide standards for train stopping distances. Should FRA establish uniform standards to assure that signals are adequately spaced?*

NO. Section 236.24 is adequate. It would be extremely difficult for the FRA to specify braking distances since each Carrier may use different brake pipe pressures and the full service application may be applied at different rates from Carrier to Carrier. The makeup of trains as to average tons per effective brake, type of brake shoes also is different from train to train. In other words, there are too many variables to make a uniform regulation applicable to all, and such braking distance should be left to the individual road to determine. In Question 23, the first sentence is incorrect. Section 236.24 does not provide that spacing of roadway signals is based upon braking distances of maximum tonnage trains operating at track speed. It does provide that signals shall be located with

respect to signal or signals in advance governing movements in the same direction so that the indication of a signal displaying a restrictive aspect can be complied with by means of a brake application other than an emergency application. Section 236.24 is adequately structured to provide for safe train operation.

24. *Due to improper location of a signal with respect to insulated joints, a locomotive may occupy a block without shunting the track circuit. Where route locking is provided, protection is given by requiring that route locking be effective before the first set of wheels of the locomotive has passed more than 13 feet beyond the signal governing its movement. (Sections 236.302 and 236.408). Should other signals be required to display their most restrictive aspect before the locomotive has passed more than 13 feet beyond them?*

Question 24 is not a correct restatement of either 236.302 or 236.408. First, reference should have been made to "locomotive or car" since a car may precede the locomotive in a reverse move or a shoving move. Secondly, both rules state — "When the first pair of wheels of a locomotive or car passes a point not more than 13 feet in advance of the signal governing its movement", not before the first wheels, — etc.

Sections 236.302 and 236.408 are adequate. There is no need to require this 13 foot limitation at other signal locations.

25-26 Track Circuits

25. *Should standards be developed to prescribe the maximum permissible foreign current in track circuits?*

NO. The ideal situation would be the ability to regulate the sources of foreign currents such as utilities, pipe lines and underground mines and require them to take any necessary steps to mitigate such interference. There are many variables to be considered, and it would be extremely difficult to monitor track circuits at all times to insure that some arbitrary level is not exceeded. Power line fault currents or circuit unbalances could appear suddenly and disappear as rapidly. Variable soil conditions, weather, track structure, bonding, etc., would make the task difficult, if not impossible. Where foreign currents are discovered or known to exist, there are techniques and equipment available to minimize the effects.

26. *Section 236.51 requires that a track circuit be de-energized under certain conditions.*

a. Should the removal of a crossing frog be one of those conditions?

b. The track circuit must be de-energized when a car occupies the fouling section of a turnout. Problems occur when the limits of the fouling section are not sufficient to safely accommodate the overhang of certain equipment beyond the nearest wheel contact point. Should FRA prescribe minimum standards for clearance points?

(a) NO. Train movements are adequately protected by the Carriers' rules when a crossing frog is to be removed. I know of no problems such removal has caused on this property.

(b) NO. Clearance points vary from Carrier to Carrier, and also from state to state by regulation. It is usual practice when locating insulated joints on this property to provide for overhang of equipment on the property. AAR signal drawings covering turnouts provide for overhang in the location of insulated joints. I see no necessity to establish a regulation prescribing minimum standards for clearance points.

27- Wires and Cables

The existing regulations for wires carried over pole lines require only that they be tied in on insulators (Section 236.71) and that sufficient clearance be provided where persons are permitted on top of cars (Section 236.72).

a. Should FRA prescribe other safety requirements for pole lines?

b. Section 236.108 sets minimum allowable resistance standards for wires other than those carried over pole lines. Should FRA prescribe minimum allowable resistance standards for wires carried over pole lines?

(a) The AAR recommended revision of Section 236.71 is adequate, and other safety requirements are not necessary.

(b) The question is not clear since Section 236.108 refers to insulation resistance test, whereas question (b) wording would infer wire resistance. In either case, my answer would be NO. We do not refer to the covering on signal line wire as insulation, it is referred to as "weather-proofing". Due to right-of-way fires, the weatherproofing has been or will be destroyed in many instances, and bare wire remains. There would be no way to check "insulation resistance" if that is what the question refers to under the conditions that exist. Insofar as line wire resistance is concerned, this has no bearing on safety. You would design your circuits to consider the losses involved. My answer to (b) is also NO.

28-33- Inspections and Tests

The existing regulations identify the devices that are to be inspected and tested and prescribe the frequency of those inspections and tests. The method of inspection and testing is determined by the railroad subject to FRA approval. Each device and apparatus must be maintained in condition to perform its intended function.

28. *Are railroad inspection and test methods adequate or should FRA prescribe uniform requirements for the performance of each inspection and test?*

Railroad inspection and test methods are adequate and prescribed uniform requirements by regulation are not necessary to accomplish such inspections and tests. What does it matter how an inspection or test is performed so long as it is performed in a timely manner and with consideration for safety of train operation, and the end result of the inspection and test achieved. This is

FRA Safety Inquiry

Signal RS&I

again a Carrier's managerial prerogative, and flexibility in achieving the end result is necessary.

29. *There are no requirements for the performance of operating tests to determine whether a device or apparatus functions as intended.*

a. Errors in connection or adjustment of devices are a frequent cause of false proceed signal failures that could be avoided by proper operational testing after installation or adjustment. Should operating tests designed to determine whether a device or apparatus functions as intended be required subsequent to installation or adjustment?

b. Should operating tests also be required periodically?

(a) Any signal employee worth his "salt" knows that operational checks are required when any repairs, adjustment changes or replacements are made in any part of the signal system that may affect the operation of that system. All railroads continually bring this subject to the attention of their employees. There is no need to establish a regulation, and I see no practical way that a uniform operational testing set of procedures could be formulated to cover all carriers.

(b) Initial operating tests are performed when installations are first installed. There is no need for periodical operational tests thereafter except as provided in (a) above.

30. *Grounds are a major cause of false proceed signal failures but are not subject to periodic testing. Should such tests be required?*

YES. The AAR has submitted a proposed rule covering such periodic testing of grounds.

31. *The frequency of the various periodic inspections and tests required of S&TC equipment is specified in the following subsections of Part 236: .102-.108, .376-.387, .476, .576, .577, 588-.590.*

a. Certain equipment such as semaphore signals and relays and mechanical interlockings, is no longer manufactured. Does the age and failure potential of this obsolete equipment make more frequent inspection and testing necessary to assure safety?

b. Are there newer and improved types of equipment that need less frequent inspection and testing?

c. Within the past five years, there have been two major accidents involving fatalities caused by defective bridge locking. Considering the accident history and the stresses usually imposed on such moving parts, should moveable bridge lockings be tested more frequently than annually (Section 236.387)?

(a) NO. On our property we now have semaphore signals in operation more than 50 years old. In 1977 we replaced a section of semaphore signals over 60 years of age. We feel that the current testing periods are adequate to insure proper operation. It should be the carrier's right based on his judgment whether more frequent inspections are required, and not a mandatory regulation. Age of the devices should not be the ultimate criteria for increase frequency of inspection. If parts are unobtainable, replacement will take care of age and obsolescence

(b) YES. The AAR has suggested revisions to RS&I in consideration of newer and improved types of equipment. The improvement in relays and experience to date certainly mandates that the period of test be extended longer than each two years. It is not uncommon for relays to remain in service for periods as long as 25 years and longer and still meet the operating tolerances without adjustment. This certainly indicates that a 2-year test period is too frequent for relays. A 5-year period, although conservative, would be more realistic.

(c) NO. Annual testing of movable bridge locking is sufficient as required by Section 236.387. We have two signaled lift spans in service, and our experience indicates that annual testing is enough.

32. *Testing of approach locking, time locking, time releases, and timing relays is required only in interlockings. Should the testing of these devices used in other S&TC systems also be required?*

The question does not agree with Section 236.476 which requires tests for Traffic Control Systems, as well as interlockings. This appears sufficient to me. I know of no other segment of signal systems where such testing would be necessary. Where such testing is required, it should only be necessary at the time of original installation or whenever circuit modification would justify such tests.

33. *Records of the required tests must now be filed in the office of the division in which the tests were made (Section 236.109). Should additional locations be allowed? How long should these records be retained?*

I presume the question should have read "— in the office of the division *on* which the tests — etc" instead of "— in the office of the division *in* which the tests — etc". Also that it should ask "Should additional locations be required?" instead of "Should additional locations be allowed?" Each carrier has different organizational arrangements, some have divisions, others have regions,

and others districts. It should be the carrier's managerial prerogative to stipulate where the test records shall be filed, advising FRA representatives of that location. This would permit relocation of the records in event of organizational restructuring by the carrier, and should pose no burden on FRA representatives since they would be advised of record locations.

For retention of records, only the last record should be retained. No purpose is served by longer retention.

34- Automatic Block Signal Systems

Section 236.204 requires in part: "In absolute permissive block signaling when a train passes a head block signal it shall cause the opposing head block signal to display an aspect requiring a stop." This requirement permits opposing trains operating on the same track to meet at locations where there is no siding. Should Section 236.204 be amended to require that whenever a train passes a head block signal "it shall cause the opposing head block signal at the next siding to display an aspect requiring a stop".

NO. Section 236.204 is adequately written to provide for safety of train operation. It provides for signals so spaced and controlled that adequate braking distance will be available to each opposing train to come to a stop. In the event that one or the other of the crews failed to comply with the rules or overlooked a meeting point, they would safely meet out in the country, and the inferior train would be obligated to back up and get in the clear. The rule is more than adequate, and requires no change.

35-37 Interlockings

35. *Are the current regulations governing interlockings appropriate for the present railroad environment?*

The AAR has submitted certain rule changes which include some changes in interlocking regulations. I agree with AAR's proposal.

36. *Section 236.307 prescribes requirements assuring that the route of an interlocking cannot be changed before all units have completed their required movements. Specifically, signals cannot be cleared once the interlocking signal indicates stop unless its approach signal indicated approach prepared to stop. Are there alternative methods which provide protection equivalent to that prescribed in the existing regulation?*

YES. Indication locking can be provided by means of audio frequency or carrier frequency overlay circuits if this is what the question refers to.

37. *Section 236.313 sets forth specifications for pipe used in operating connections at interlockings. Are these specifications appropriate? Should there be similar specifications for pipe in all S&TC systems?*

The present trends are to retire pipe-connected interlocking plants and replace with more modern systems. The present rule has served adequately for many years, and I see no need or requirement to change.

38-39 Traffic Control Systems

38. *Section 236.401 specifies the automatic block signal and interlocking standards that are applicable to traffic control systems. Are these standards adequate?*

YES. The record speaks for itself.

39. *Should FRA specify where signals must be provided in traffic control systems?*

NO. The location of signals in any signal system must be left to the judgment of the carrier as a managerial prerogative. How many or how few signals that are to be installed can only be determined by the carrier for the operating requirements involved. Once the signals are located, the rules prescribe how these signals shall operate and what tests and inspections are required. Even if it were decided that this was required, which it is not, there is no practical way that a regulation could be written to be universally applicable, due to the many varied factors that must be considered on each property and each situation.

40-45 Automatic Trainstop, Train Control Cab Signal Systems

As explained above, Subpart E of Part 236 contains many requirements that overlap those of the Order issued in ICC Docket No. 13413. Therefore, many of the issues applicable to Subpart E have already been addressed in the discussion of ICC Docket No. 13413 and will not be addressed here. FRA recognizes that Sections 236.527, 236.530, 236.533, 236.558, and 236.559 address systems that are no longer in service and intends to amend or delete these sections as appropriate.

40. *Are the rules, standards, and instructions for automatic trainstop, train control, and cab signal systems contained in Subpart E otherwise appropriate in today's railroad operating environment?*

The AAR has submitted suggested changes of an editorial nature, or for clarification. I agree with AAR's proposal.

42. *Seals are currently required on automatic trainstop and train control devices in the locomotive.*

a. Should seals be imprinted in a manner that indicates the place of application?

b. Should seals also be required on automtic cab signal devices?

(a) I do not see that safety would be served by imprinting on the seal the place of application.

(b) If the lack of a seal on automatic cab signal devices is creating an unsafe condition and there is supportive evidence so indicating, then the use of seals should be considered.

43. *Section 236.567 permits a locomotive with an S&TC device that fails en route to continue to its destination under certain restrictions. Under this regulation, a train may travel long distances in equipped territory without the protection of the devices and may even pass through one or*

Signal Training Bulletin

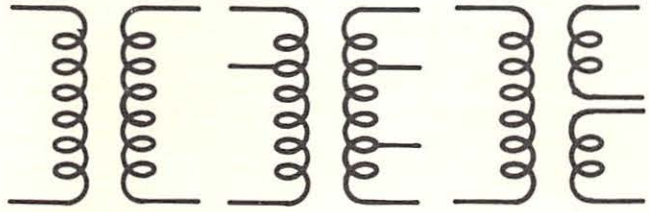
COMMITTEE G: Education & Training
Communication & Signal Section, AAR

B-6 Transformers

Approved January 1974

Definition: Transformer: An inductive device used for changing the ratio of voltage and current in two parts of an alternating current circuit or for insulating one part of a circuit from another.

Symbol:



Description: A simple transformer consists of two coils very close together, electrically insulated from each other. The coil to which ac is applied (source) is called the primary. The coil from which the transformed ac is taken is called the secondary (load). The coils are not physically connected to each other. They are however, magnetically coupled by means of a common iron structure known as the core. The basic construction of a transformer is illustrated in Figure 1.

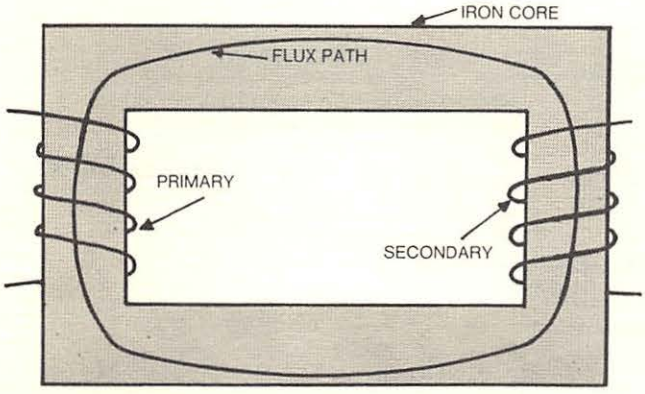


Figure 1

Figures 2(a) and (b) are examples of transformers in common use in railroad signaling.

Figure 2(a) shows a tapped transformer which is capable of supplying any whole voltage between 1 and

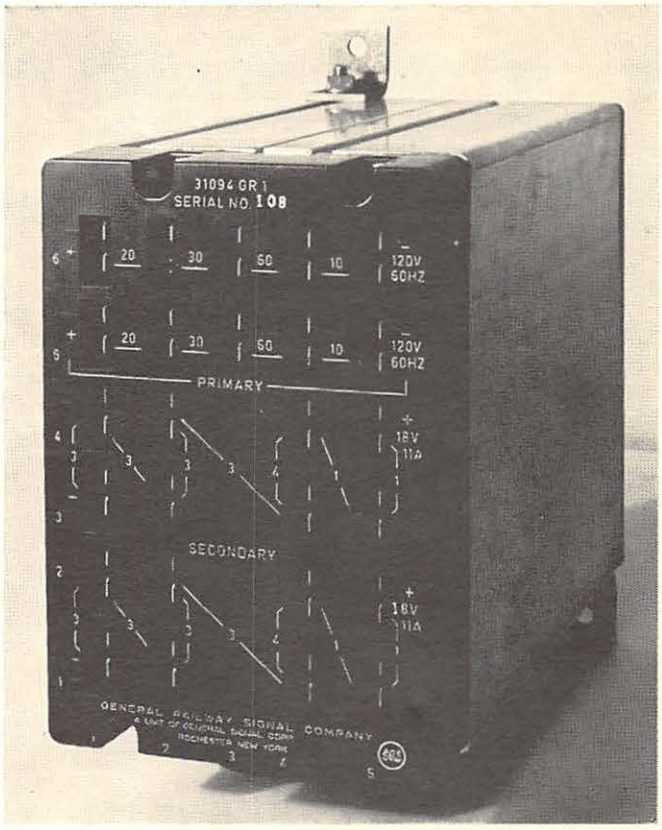


Figure 2(a) Tapped transformer

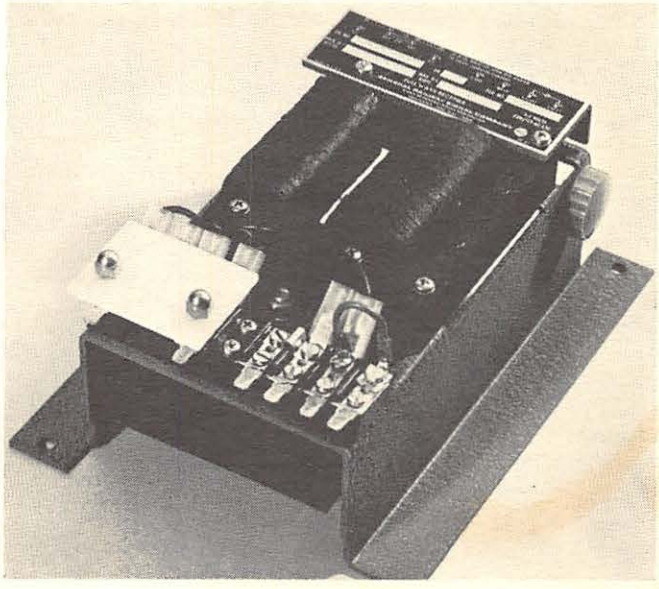


Figure 2(b) Signal rectifier (rectifier stacks removed)

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15 volts ac from the secondary when the primary is connected to either 110 or 220 volts ac. This type is often used to supply signal lamp circuits.

Figure 2(b) shows a magnetic shunt type transformer—rectifier unit used for charging batteries. The output voltage from the secondary may be precisely adjusted by use of the adjusting knob. (upper right corner of illustration).

Purpose and Application: The most common signal application of the transformer is to increase or decrease ac voltage. When the voltage available at the secondary is lower than the voltage applied to the primary it is called a step-down transformer. A transformer that has higher secondary voltage than primary voltage is called a step-up transformer. The use of step-down transformers in signaling provide real savings in power and material costs.

The savings in power costs occur because the use of transformers makes it possible to transmit relatively high voltage ac (220 volts, 550 volts, etc.) over long distances with minimal power losses in the line. Although the line wires do have low resistance, high current through the wires will result in high power dissipation in the line.

Power in an electrical circuit is the circuit current squared, multiplied by circuit resistance. $P = I^2R$. By considering the formula it may be seen that any reduction in current will significantly reduce the power dissipated. By employing high voltage such as 550 volts ac and step-down transformers at the signal locations it is possible to transfer the energy from the commercial source to the remote signal location with low line currents and therefore low line losses.

The savings in materials occur because only one ac transmission line is used to supply many lower ac voltages required at the signal location. For example, a typical bungalow at a power switch signal location will often require 110 volts ac for bungalow lighting and appliance outlets, 10 volts ac for signal lamps, 30, 13.5 and 3 volts ac for storage battery chargers. If a separate pair of line wires had to be run from the ac source to provide each of these voltages the cost would be extreme. Each of the lower voltages may be obtained through the use of step-down transformers connected to the one high voltage transmission line.

General Information: Transformers are very efficient. They require little maintenance other than to be kept clean and dry. Terminals must be kept tight and clean.

Detailed Operation: The transformer functions on the principle of mutual induction. The term mutual induction refers to the condition in which two circuits are sharing the energy of one of the circuits. It means that energy is transferred from one circuit to another.

The following description is not intended to cover all the theory of self and mutual induction which are involved in transformer action. Instead, the basic operation of transformers is discussed followed by a brief application to two types of signal transformers.

First, induction only occurs when the current is changing. Two examples of changing currents are alternating current (ac) or pulsating direct current. Induction does not occur with steady direct current. Steady direct current should not be applied to a transformer winding because the resistance to dc is quite low and the transformer could be damaged by the resulting high current flow.

NOTE (1) When a changing current such as ac is passed through a coiled conductor a changing magnetic field of flux is produced about and within the coil. If a magnetic material core is placed within the coil so that the flux lines cut across the core the core becomes magnetized. Since the magnetizing force is produced by ac which is constantly rising and falling and changing direction the strength and direction of the magnetism in the core is in step with the ac. This occurs in a transformer primary.

(2) When a conductor is placed within a changing field of magnetic flux so that the flux lines cut across the conductor a voltage will be produced across the conductor. If the conductor is coiled so that many conductors are cut by the moving magnetic field a higher voltage will exist and will be in proportion to the number of conductors cut. This occurs in the transformer secondary.

When ac is applied to the primary winding of the transformer and the secondary winding is connected to a load there is a transfer of energy from primary to secondary. The ac entering the primary is rising, falling and changing in direction with the frequency

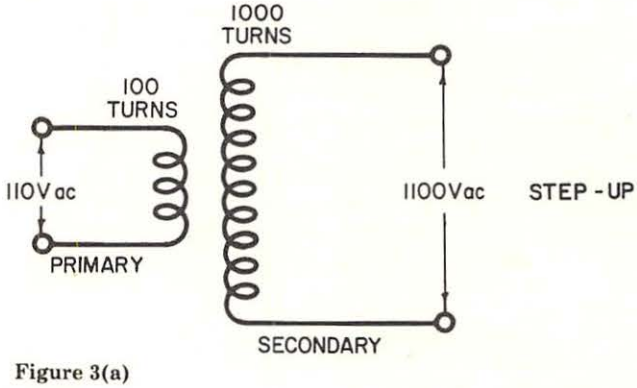


Figure 3(a)

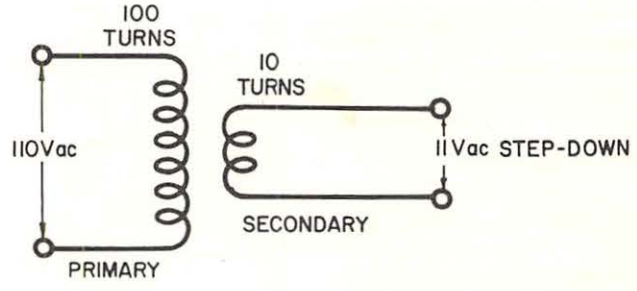


Figure 3(b)

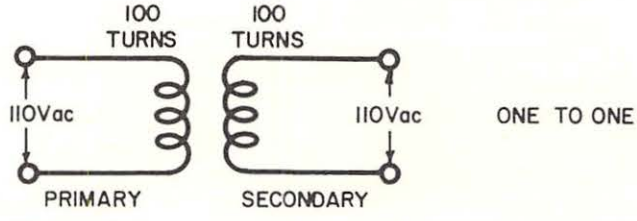


Figure 3(c)

(60 HZ). This action produces a magnetic field of flux in the core which is building up, collapsing and changing direction at the same rate as the ac source. The core is common to both primary and secondary therefore the changing magnetic flux field is cutting across the conductors of the secondary windings and an electric current is induced in the secondary.

As mentioned in the Note the more conductors that are cut by the magnetic flux the higher the voltage. In transformers the relationship between primary turns of wire to secondary turns determines if it is a step-up or step-down transformer. If the number of primary and secondary turns are equal, the voltage in equals the voltage out.

In Figure 3(a) the secondary has ten times more turns than the primary. The 110 volts ac at the primary is transformed to 1100 volts at the secondary (step-up transformer).

In Figure 3(b) the secondary has ten times fewer turns than the primary. The 110 volts ac is transformed to 11 volts at the secondary (step-down transformer).

In Figure 3(c) the primary to secondary turn ratio is equal. The voltage out equals the voltage in. This transformer is referred to as an isolating or insulating transformer and is sometimes used in signaling where an ac signal is superimposed on a dc line circuit network. The transformer will pass the ac but will block the dc from flowing in parts of the circuit where it is not wanted.

Transformers are also used to eliminate shock hazard by isolating the grounded source from the equipment circuits.

It would appear that a step-up transformer gives something for nothing. This is not true. Although a step-up provides more voltage at the secondary the current capacity is down. Power is the important consideration since this is the measurement of work. Because a transformer is such an efficient device the power in almost equals the power out. Therefore, if a 0.100 ampere load was connected to the secondary (Figure 3(a)) the power consumed would equal 110 watts since P (power) = E (voltage)xI (current) = 1100x0.100 = 110 watts.

If the secondary load is consuming 110 watts then primary must also be 110 watts. Entering the known values into the formula P = EI the current in the primary is found to be 1 ampere.

$$P = EI \text{ or } 110 = 110 \times I$$

$$\text{or, } I = \frac{110}{110} = 1 \text{ ampere.}$$

In the case of the step-down transformer in Figure 3(b) a 10 amp. load on the secondary would result in a 1 amp. current in the primary.

This is why use of high voltages and step-down transformers in transmission circuits reduces line losses. Even though the signal load requires high current at low voltage the current present in the transmission line is quite low and depends on the step-down ratio. If a 10 volt load is being supplied by a 550 volt transmission line and step-down transformers the line current is 55 times less than the load current.

Signal Application: Figure 4 schematically represents a tapped transformer. By connecting taps to the secondary at various points the primary to secondary turns ratio may be selected to suit the need.

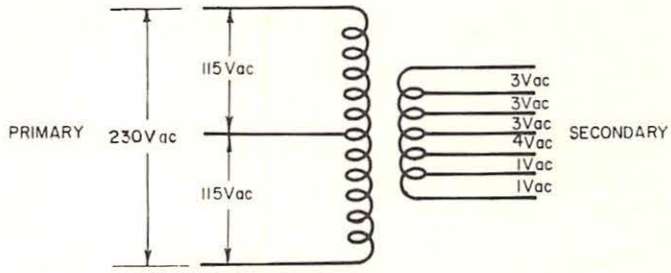


Figure 4

An ac voltmeter reading taken across the entire secondary would show 15 volts. A reading between the bottom two taps would indicate 1 volt. The position of the tap is selected so that any whole voltage between 1 and 15 is available. This type of transformer is used to light signal lamps and supply other ac equipment such as power off relays.

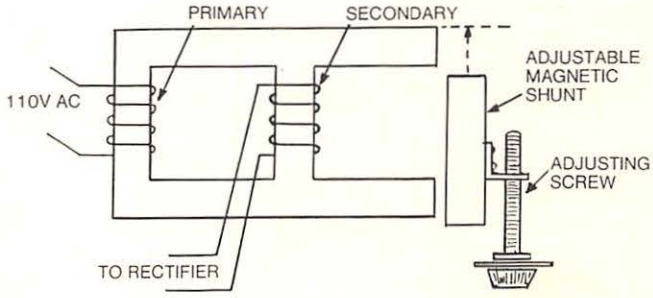


Figure 5

Figure 5 illustrates a transformer of the magnetic shunt type. The output voltage may be adjusted by moving the magnetic shunt. Suppose the primary to secondary turn ratio were such that 110 volts ac applied to the primary resulted in a maximum of 3 volts ac at the secondary. The 3 volts would be present when the adjustable shunt is in the position where the largest air gap exists between the shunt bar and the core structure. Note that the shunt provides an additional path for the magnetic flux developed in the primary. This path diverts some of the magnetic flux away from the secondary core and is not available to develop voltage in the secondary. By use of the adjusting screw the shunt may be moved until almost all the magnetism takes the shunt path. This feature provides a means to control the secondary voltage very precisely to obtain the voltage required for fine calibration of the battery charge rate.

Notes

more established facilities for testing and repair of the devices. Should the prompt repair of the failed device or substitution of a locomotive with operative device be required?

NO. Additional relaxation of present restrictions of Section 236.567 should be granted instead of imposing further restrictions. The AAR has submitted proposed changes in this rule. I agree with their proposal.

45. *Records must be now made of the results of the various tests performed on locomotive devices. However, except for the departure test usually performed by or in the presence of the engineer, the results of the tests are not available to the engine crew. In the case of interdivisional runs, the relieving engineer does not have access to the results of the departure test. Should copies of all tests be required to be kept in the cab of the locomotive?*

NO. I can see no way that safety would be served by such requirement.

46-47 Definitions

Subpart G of Part 236 defines terms intended to be applicable to all sections of the rules, standards, and instructions for signal systems.

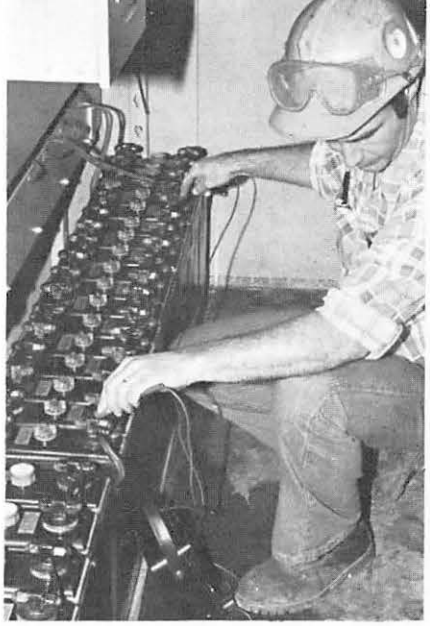
46. *Section 236.831 (a) defines main track as excluding auxiliary tracks. Section 236.410 requires the use of an electric lock on switches on main track in traffic control territory where speeds exceed 20 miles per hour and train movements are governed by signal indications. FRA has always held that these requirements apply to signaled sidings. However, this has been challenged recently. The problem arose when the present definition of main track was adopted to prevent the applications of Sections 236.502 and 236.504 to sidings. Apparently no consideration was given to the possible effect of this change on other sections. FRA believes that the following definition of main track: "A track, the use of which is governed by block signals, or upon which trains are operated by timetable or train orders, or both" together with appropriate amendment of Sections 236.502 and 236.504, would clear up the present confusion. Would these changes create other problems?*

There is no confusion in the minds of the carrier as to what trackage constitutes a main track and what trackage constitutes a siding. FRA's proposed definition of main track is neither correct nor is it satisfactory. Whether a siding is or is not signaled does not change it from siding to main line trackage classification insofar as the requirement for an electric lock under FRA's definition of siding trackage is concerned.

I have stated in response to Question 3 that the requirement for electric locks should be eliminated since they are not required to insure safety.

Such definition as FRA proposes would, in my opinion, be contrary to established understandings of what does and what does not constitute main track, would impose on the carriers operating inefficiencies, and eliminate any initiative on the part of the carriers to signal sidings.

FRA Safety Inquiry



Signal RS&I

47. *Where can the definitions be improved? Do any further terms need to be defined?*

It would seem appropriate for the FRA and AAR to get together periodically and review the definitions since technology is continually changing, and some changes will need to be made from time to time. Question 46 is a good example of this need.

48-51 Remotely Controlled Locomotives

Techonological advancement has proven the feasibility of remotely controlled locomotives in railroad operations.

48. *Should all transmitting and receiving channels of remotely controlled locomotives and their controlling locomotives be tested prior to departure to ascertain that they function properly?*

NO. Safety features are designed in the equipment used which verifies signal continuity between master and slave units, as well as other vital requirements. Many units are in service, and the historical record does not indicate a need for a regulation of this nature.

49. *Should there be a Federal requirement that loss of continuity of a predetermined duration will automatically result in shut-off of power in the remotely controlled locomotive? What should this duration be?*

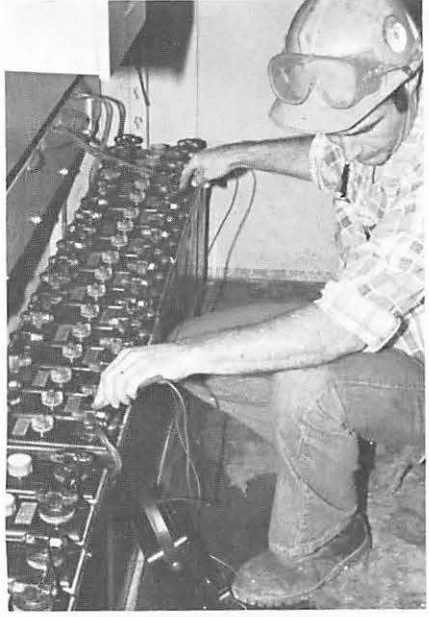
NO. Same response as 48.

50. *Should a predeparture test be required to verify that the feed valves on all remotely controlled locomotives automatically close following loss of continuity or application of the brakes on their controlling locomotives?*

NO. Same response as 48.

51. *Should physical deactivation of the command modules on all remotely controlled locomotives be required before their controlling locomotive is removed from the train consist?*

NO. Same response as 48.



FRA Safety Inquiry

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Missouri Pacific presentation to the FRA about its safety inquiry on signals & communictions was made by John G. German (right) vice president engineering. J. F. Derochie (left) signal engineer assisted in the presentation at the February hearing.

Missouri Pacific comments S&TC safety

Introduction:

My name is John G. German and I am Vice President of Engineering for the Missouri Pacific Railroad (MoPac) at St. Louis, Mo. During more than 34 years of continuous railroad service I have been involved in the design — construction — maintenance and operation of locomotives and freight cars. In addition, for the past 12 years, I have been in charge of the roadway — track — structures — signals and communications on MoPac.

We appreciate this opportunity to make our thoughts and needs known to the FRA. We strongly feel that these hearings can and must lead to further discussions that will allow the introduction of economic logic and new engineering technologies into the existing signal regulations that will be truly safety orientated.

MoPac shares this Board's concern for safety. MoPac is vitally interested in attaining safe operations. Not only can personal injuries, fatalities and property damage make serious inroads on a carrier's ability to meet its financial obligations, but they disrupt normal maintenance programs and traffic and can eventually cause loss of revenue. The result is a vicious cycle in which unnecessary expense and loss of traffic prevent proper repairs and upgrading with a resultant slowdown in operations, further loss of competitive position, etc.

Unfortunately, this hearing and others in the present series covering FRA Safety Regulations will not even touch upon the basic problem faced by the railroad industry in the United States. The basic problem is that we have no national policy on railroads and thus there is no concerted effort by Congress, the Interstate Commerce Commission and the Federal Railroad Administration to develop a climate that will permit our railroads to:

(1) Earn a decent rate of return for this very capital intensive industry, and

(2) Permit equality in competition with other modes of transport.

We absolutely do not condone nationalization, nor do we recommend subsidization. We only ask for the opportunity of free enterprise by benefit of reduced regulation.

If the United States of America has a national transportation policy and the railroads are a portion of that policy, it certainly has never been set forth in print for review and comment. If the recent flurry of activity in the area of deregulation for railroads is a part of an unwritten national policy it certainly hasn't permeated down to the Office of Safety, which has recently promulgated some sweeping changes in the Freight Car Safety Standards and obviously is demanding more regulation than less. We certainly pray that there will be a change of attitude and policy by the time the Signal Inspection Act receives its review and necessary changes.

The Signal Inspection Act was passed in 1937 and the ICC issued their rules and regulations by order on April 13, 1939. In a large part, these rules and regulations were written around practices already adopted by the Signal fraternity in this country without any government intervention. Since no railroad can afford the delays and danger of an ineffective signal systems, I personally see no need for the redundant FRA Rules, Standards and Instructions.

The specifications and standards for the manufacture and maintenance of equipment, as promulgated by the AAR and Signal suppliers, are more meaningful for safety than the FRA rules that tell the industry that we must test these appliances and devices periodically to insure that they meet the manufacturer's specification. However, the Act is law and we all must work diligently to revise it so that it not only promotes safety but that it does so in a way that will allow the industry to change, grow and prosper.

MoPac's Signal Program:

In 1961, the Missouri Pacific started a program of consolidating all dispatching on the system. By the end of

1980, or in early 1981, we will have all of our trains dispatched from three centers — Houston, TX (4,294 miles) — Little Rock, AR (3,131 miles) and Kansas City, MO (3,614 miles), for a total of 11,039 miles of operated track. Our signal system comprises 2,862 track miles of Traffic Control System and 2,716 track miles of Absolute Block Signal for a total of 5,578 miles of signals.

In 1961 MoPac instituted a vigorous maintenance program which was expanded to include each subsidiary line or merger partner. Our management has long been convinced that only a physically strong railroad can be competitive and survive. We are most fortunate to serve a rapidly growing part of our nation so that we could take this approach. Even so, growth beyond our original projections and changes in traffic patterns, such as the large influx of western coal, have posed problems in coping with these changes, while at the same time continuing our plan for overall plant improvement.

Our 1978 budget for Maintenance of Way — Structures — Signals and Communications was nearly $168,000,000! Nearly $10,000,000 was directed toward the maintenance of signals alone.

In addition, we are in our seventeenth year of a vigorous capital expenditure program to upgrade and expand our facilities and equipment. During the year 1978 we expended $5,596,000 for additions and betterments involving Signal Systems such as converting 203 miles of Absolute Block Signals to Traffic Control Systems, installing 12 hot box detectors, adding remote control switches to yard tracks and moving dispatcher consoles from Chester, Illinois to Little Rock, Arkansas.

Our maintenance budget for 1979 for Signals and Interlockers amounts to $12,180,000. Our Capital Improvement Program for 1979 is a total of $3,023,000, which covers such things as 14 remote control flat yard switches, providing 36 electric snow melters to power switches, converting 78 miles of ABS to TCS, installing 12 hot box detectors and upgrading 3 gravity retarders to 160 tons capacity.

MoPac's Safety Performance:

As I pointed out in earlier testimony last year, MoPac has considerably improved its safety performance within the past few years. In 1977 we earned the Harriman Bronze Award for the third best safety performance among the Class I railroads. Despite further improvements we will again be in third place for 1978. While MoPac was ninth in revenue ton-miles in 1977, based upon latest DOT Railroad Accident Bulletin No. 146 for 1977 we were second lowest in train accidents and third lowest in cost of train accident per revenue ton-mile.

Our past improvements in safety and continued dedication to improve even more in the future rests not only on our long-standing vigorous maintenance and improvement programs, but also upon our active endeavors to:

- Teach safe work methods and habits
- Frequently sample performances
- Discipline violations of long-proven safety rules

Obviously, we still have room for improvement, but you can rest assured that MoPac will continue its efforts in this regard.

During the past 3 years, MoPac experienced 21 alleged reports of false clear signals which were fully investigated and reported to the FRA. In most of these cases the FRA signal inspectors made the test and inspection with us. In no case was there an accident or a violation of the RS&I rules. The alleged failure modes are:

Failure Mode	No.	Per Cent
Undetermined	10	47.6
Vandalism	5	23.8
Storm conditions	3	14.3
Human factor	2	9.5
Equipment	1	4.8
	21	100.0

The ten "undetermined" covers those alleged failures which defied assigning any cause. After exhaustive investigations nothing was found to be malfunctioning, thus it can be assumed that in this category many, if not all, did not occur in the first place. The remaining eleven alleged false clears were determined to have actually occurred. Corrective action was taken immediately to make the signal system safe. The most common cause of verified false clears was due to vandalism which is an increasing cause of grave concern to the railroad industry. In our estimation you cannot legislate vandalism out of existence under the Signal Act rules, but perhaps stiff Federal legislation against vandalism on railroad property, coupled with stern action by police and courts, will get our society back on even keel.

Only eleven verified false clears on a railroad that carried over 305 million gross ton-miles in the past three years is certainly an enviable safety record. MoPac has 9,816 track circuits controlling 7,156 signals on 5,578 miles of mainline track. We conservatively estimate an excess of 295 million signal operations with only 11 proven malfunctions — a remarkably low percentage of one out of nearly 27 million operations with no resulting train accidents. Obviously the national picture is very good also. FRA Report No. 146 shows only 3 accidents caused by fixed signal failures and no injuries or fatalities in 1977. Also, we have an enviable record for restrictive signals vs. operations, 1 out of 132 thousand signal operations which we intend to improve within the next year. Gentlemen — our system is safe and we intend to keep it that way with or without regulation.

Existing Signal Safety Standards:

MoPac heartily concurs with the AAR industry statements presented at the beginning of this hearing. In addition, we offer the following comments for consideration when the existing safety standards are revised:

The Signal Inspection Act 49 USC 26 (b) states "That the Commission may, — order any carrier — to install the block signal system, interlocking, automatic train

stop, train control, etc. — to promote the safety of railroad operations. . . ."

Railroads have historically installed ABS signaling, TCS systems, interlockings, etc. to protect and expedite train movements where return on investment was such that they would enhance both safety and economy. Seldom has the ICC or the FRA invoked its powers to order the installation of a system. Never has the ICC or the FRA refused to approve these many voluntary improvements. Since 1970 MoPac has spent in excess of 12.5 million for the installation of 251 miles of new CTC and the conversion of 631 miles of ABS to CTC. In 1980 another stretch of 125 miles of ABS will be converted to CTC. This money was spent not by the decision of the federal government, but by the decision of a private corporation in order to promote safety where traffic density had increased so as to warrant such expenditure.

I would like to address that part of Section 26 (b) that prevents railroads from discontinuing or materially modifying any system without approval of the FRA. There are many instances where the traffic patterns changed so that existing signal systems were no longer needed for safety purposes due to decline in train operations over a given sector. Also, it was not economical to maintain or renew these systems. However, applications to the FRA were declined and the railroads have been forced to maintain or renew systems that were not justified on either an economic or safety basis. We get the impression that such decisions have been made by those who are unfamiliar with practical railroad operation in general and did not understand the particulars accompanying the specific requests. The point is a railroad should have the same option for voluntary abandonment as for the voluntary installation or upgrading. Why retain obsolete high maintenance signal systems for a low traffic density that could not justify signaling if it were a new track segment? The inability to remove out-dated systems has caused an economic drain on monies which could have been used for installing or updating signal systems or more important portions of the railroad.

Furthermore, the length of time (up to 12 months) it takes the railroad to submit and obtain approval of an application for discontinuance or modification of the signal system is absurd. Such procrastination greatly hinders railroads from quickly reacting to changing traffic patterns.

Applications for applying left hand signals and for removing or respacing signals for changing train weight and speeds should not have to be made. This should be left up to the judgment of the railroad involved. Certainly no signal engineer would put a signal in a position where it would be confusing to the train engineer, nor would he space the signals to where the train could not be properly stopped. If such should ever occur, then that signal engineer would place trains in a position of danger from collision or accident which could cost the railroad company, not the FRA, vast sums of money. This would

FRA Safety Inquiry

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have a very detrimental effect on the profit picture and jeopardize the continuance of not only the signal engineer but possibly the railroad and signal system as well.

MoPac believes that the rule changes proposed in the AAR response will help the railroads become more viable and reactive to changing situations. MoPac not only endorses the AAR response to Docket No. RSSI-78-5 but would like to comment specifically on the following questions posed in that notice.

General:

Only those rules which truly pertain to safety, not maintenance practices, should be reviewed, revised if necessary and retained. The cost/benefit impact of each such rule must be carefully considered.

We do not agree that the S&TC regulations are minimum requirements nor do we believe that they encourage lower levels of inspection, maintenance or repair. We welcome the activities of your signal inspectors on our property.

In our opinion some of the present regulations do deter from the installation of new systems, i.e., electric lock requirements in CTC systems.

Where we have heavy movements of coal, grain and petro-chemicals we are extending sidings and relaying with heavier rail so as to safely expedite these movements. Logically it would be desirable to use 35 mph turnouts and signal such sidings so that any train entering would have a diverging approach signal (red over yellow) to indicate that there is no broken rail, misaligned switch or rolling stock fouling the siding. This is particularly important to the movement of chemical trains.

However, due to the FRA interpretation that a signaled siding must be reclassified to a second main plus electric lock rule 236.410 all hand operated switches in such segments would have to have electric locks at a cost of $10,500 each. Reclassifying the track adds nothing to safety. Electric locks will not prevent rolling stock from fouling, but they do add to the complexity of circuitry

and ensuing maintenance, and from a safety of operation standpoint the money spent on these devices can better be spent on more critical needs in signaling.

Rule 236-410 should be dropped and trains should be permitted to exceed 20 MPH on signaled sidings if the class of track and size of turnout so permits. Circuit controllers and the 5 minute wait rule will provide as much protection as electric locks, as evidenced by the thousands of such movements made safely each day. The signaled siding will give the trains entering far more safety than non-signaled segments.

Most railroads, on their own initiative, have established education programs. For years we combined a correspondence course with on-the-job training, but more recently we have established a training school at North Little Rock, Arkansas for our signalmen. The Brotherhood of Railroad Signalmen has been most cooperative in our training efforts. The extremely low rate of malfunction for the signal systems on MoPac, and the country as a whole, is proof enough that there is no need to establish federal requirements covering qualification of railroad personnel who install, maintain and test such systems. You must not overlook the fact that expeditious and safe movement of trains is our bread and butter. We cannot afford to have any unsafe maintenance or installation practices, or malfunctions of equipment.

No locality is safe from vandalism in our permissive society nevertheless we have "armor-plated" signal boxes in areas having a high incidence of vandalism. We see no point in providing additional circuit redundancy. To do so would be extremely costly for initial installation, would create considerably more maintenance and make trouble-shooting much more complicated. This is a problem of society that must be resolved by society.

Discontinuance or Material Modification:

Earlier we expressed our views on the need for the railroad to be able to make changes in its signal system without an application. The FRA needs to broaden the scope of what the railroads are allowed to do voluntarily.

Establishing starting and completion dates for proposed changes has no bearing on safety and it is not practical from the standpoint of the uncertainties of weather conditions, railroad operations and availability of material and manpower, to say nothing of the burden of having to continually update reports.

Repair without Undue Delay:

We don't quite understand the emphasis being put upon the term "undue delay". People seem to forget that we are running a business and that our business is service — the movement of goods from one point to another. If there is a restrictive signal not caused by a train on a high density segment it will get immediate attention, but if it is a low density line and no trains are due until the next evening, obviously the situation can wait until morning. This is only good business practice and is not the least bit unsafe. With the signalmen now being under the Hours of Service Act, there may well be times when the restrictive signals will have to be left until the maintainer is rested and can return to work. This is not a cause of poor railroad management, it is a cause of poor legislation.

Please note that I did not use the term "false restrictive". Signal systems are designed and built on the fail-safe principle. When any part of the system fails the result is a restrictive signal, so how can the FRA categorize such fail-safe activity as being a "false" restrictive signal? We always have, and we always will, investigate restrictive signals as quickly as possible. Even though the restrictive signal has already triggered safe operation through rules compliance it is only good business sense to determine the true cause and correct it in order to expedite train movements.

Wires and Cables:

MoPac, and the industry as a whole, purchase underground cable with a life expectancy of up to 30 years. Under Rule 236.08 such cable must be tested every 8 years and whenever the installation resistance is less than 1 megohm it has to be replaced without undue delay. However, with only 10 Volts of battery power impressed upon such cable there will be no leakage of current with such a high resistance to ground. Last year MoPac replaced nearly 245,000 ft. of underground cable at a material cost of $156,500. From the standpoint of safety, this money could have been better spent in converting 7.5 miles of ABS to CTC. Rule 236.08 should be relaxed to 0.5 megohm each 10 years.

Inspection and Test:

Many relays have been in service up to 30 years, yet we are required to test them every 2 years to see if they meet the manufacturer's specification. At the time of testing, slightly under one-half of 1 per cent are changed out. Very few are actually changed out on the drop out and pick up values, they are mainly changed out on visual inspection. Between tests, approximately 1 per cent are changed out for problems that develop due to lightning, etc. Frankly, increasing the test period to 5 years as suggested by the AAR would be a meaningful change without detracting from safety. All of the AAR recommendations in regard to changes and testing should be given favorable consideration.

Summary:

In reviewing and revising the RS&I please keep in mind that the United States signal fraternity is ultra-conservative and hence needs even less supervision than any other area of railroad expertise. The railroads have long recognized the necessity for proper operation of signals, not only for safety but to improve train performance and enhance competitive ability. It is strictly a matter of dollars and sense!

The decision to have a certain type of signal system

should be the prerogative of the individual railroad based upon its operating needs and ability to afford; likewise the decision to retire such systems should be the railroads. Whether it be dark territory, ABS or TCS, the appropriate operating rules will govern.

Resulting rules must be only those that are safety orientated, easily understood, practical in application, and divorced from maintenance standards.

Southern has comments on signaling

My name is Walter W. Simpson. This statement is presented on behalf of Southern Railway Company and its affiliated carriers, in response to the notice. With me are J. T. Hudson, assistant vice president-communications & signals, and F. H. McIntyre, general superintendent-operations in the communications & signals department (who is a member of the AAR Signal Liaison Committee). I am vice president-engineering of Southern, and the communications & signals department is included within my jurisdiction.

Southern concurs in and supports the views presented by the Association of American Railroads at this hearing. Members of our staff participated in the formulation of those views, and we think they are worthy of the most thoughtful consideration by this Administration. This statement is offered as a supplement to the AAR's testimony.

We believe that the AAR statement quite adequately covers the questions raised by the rulemaking notice and the issues presented in this case. However, Southern wants to underline its concern with the issues in this proceeding by presenting its own witness and expressing its particular views to the FRA. I will not address the individual questions raised in the rulemaking notice in the statement. I will, however, comment on them generally. A number of the questions imply that the FRA is considering changes in the existing signal standards which, while not at all contributing to safety, would contribute substantially to the cost of installing, maintaining, and testing signal equipment. These changes would make railroad operations much more labor-intensive. No corresponding safety or operating benefits would flow to the public, railroad employees in general, or the railroad.

In each of the hearings in the FRA's General Safety Inquiry, Southern has presented its own statement supplementing the presentation on behalf of the AAR. We have done this because we want to cooperate with the FRA, and are glad of the opportunity to have our voice heard in the vitally important matter of railroad safety regulation. Throughout, we have stressed the principles of economic regulation which we believe properly should be applied in safety rulemaking. Our basic theme has been that safety regulations must be cost-effective, firmly grounded on adequate risk analysis.

We consider safety of the first order of importance, and know that unsafe operation is not viable operation, economically or practically. In fact, Southern won a Harriman Award last year for its outstanding safety performance. But we also know that the resources of the railroad industry are limited. Rational choices have to be made as to how the limited resources of the private railroad sector will be allocated among competing safety and other demands. Similar decisions must be made as to the allocation of the limited resources of the public sector that are available for use in rail safety.

Safety regulations must concern safety. This means that they must be cost-effective in achieving safety. They must bear a substantial relationship to actual safety problems and not enshrine obsolete practices of the past or require rituals that have little or nothing to do with safety. The initial question must be, "Where is the risk, what is the problem to be solved?" This approach entails examination of accident/injury statistics, and cost.

Walter W. Simpson, (second from left) vice president engineering, Southern Railway System, presented testimony at the FRA hearing on signal & communications safety. Associated with Simpson are (left to right): F. H. McIntyre, general superintendent operations, communications & signals; Simpson; William P. Stallsmith, Jr., senior general attorney; and J. T. Hudson, assistant vice president, communications & signals.

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Southern believes that, by and large, the existing FRA signal and train control regulations and orders are adequate, although there are individual standards which we think should be changed and requirements which we think should be deleted. These suggested changes and deletions are contained in the AAR's presentation at this hearing.

An example of a burdensome change suggested in the questions of the rulemaking notice is question 17, on the subject of "Repair Without Undue Delay". Changes of the sort apparently contemplated in the drafting of that question would cause the railroads to employ a large number of additional employees with no appreciable increase in safety. The AAR answer to question 17 points out the lack of any need for change in Section 236.11, the signal standard in question.

In other instances, the implication fairly may be drawn that the FRA has considered extending the scope of its regulations. The result could be to inhibit new technology that would increase safety and reliability while reducing cost. For example, question 19 is "Should FRA require a safety analysis of all solid state equipment?" There is no need for such a requirement. The industry and equipment manufacturers have been handling the matter between them, satisfactorily, and there is absolutely no reason to believe that a change is necessary. The very fact of need for government analysis and approval in advance would have a chilling effect on adoption of solid-state, technological innovations. There have been too few technical advances in signal equipment in the past 20 years. If changes are to be made in the standards, they should be designed to facilitate the development and adoption of solid-state and other technological advances, not hinder them.

FRA is also apparently considering extending its regulations to cover remote controlled locomotives, judging from questions 48 thru 51. Such action would be unwarranted and unfortunate. The need for FRA standards in this area is nonexistent. I rode on Southern's first remote controlled locomotives train 20 years ago. In the 20 years since this trip I know of no safety problems — I cannot understand why after 20 years of successful operation I might now be faced with regulations telling me how to do it.

What all this comes down to is the adverse effect on saftey of too much additional cost. If it is made more costly to railroads to install, maintain, and test signal systems, then railroads will be less inclined, and less able, to install new signal devices. Southern has just completed a centralized traffic control installation between Birmingham and Sheffield, AL, about 165 miles, at a cost of some $9,000,000. We would very much like to have ctc between Birmingham and Atlanta, where we feel it is needed. The cost would be $21,000,000 even though there are already automatic block signals in place over the territory. Dollars spent unnecessarily on signal systems or maintenance practices in the name of safety, where cost-effectiveness is unproved, are dollars diverted from projects where safety and reliability would be directly served — and real benefits in safety and service could be realized by the public and the railroads.

Signals confer a great safety advantage. The FRA must allow the railroads the maximum flexibility in installing, maintaining, and testing signals, and must be sure that any changes it makes in the regulations, any requirements it prescribes, are in fact cost-effective for safety and do not inhibit innovation. Otherwise, the regulations will hurt rather than help safety. And, the burden on the financially troubled railroad industry could grow to an insupportable level.

Southern Pacific responds to Federal Railroad Administration S&TC hearing

I am R. C. Nagel — engineer of signals for the Southern Pacific Transportation Company. I have been employed by this company in various positions in the Signal Field since August, 1941. Prior to becoming Engineer of Signals on December 1, 1977, I served as Signal Engineer for approximately 10 years. I have been associated with the Association of American Railroads, Communication and Signal Section since 1967. Within the AAR, I have served as Member and Chairman of Committee "E" Interlocking, Traffic Control and Block Signal Systems. I am also a member of the Committee of Direction, the Signal Liaison Committee and presently am Chairman of the Section.

One of the major challenges facing all of us as we review the FRA regulations in all areas in this series of hearings is the problem of determining the optimum level of government intrusion into the operations of rail carriers.

Each individual carrier bears both primary and ultimate financial responsibility for the consequences of its decisions which directly or indirectly affect railroad safety. The bare outlines of the government's role in the area of the safety of signals and related structures have

R. C. Nagel (right), engineer of signals, Southern Pacific, testified on behalf of his company in the FRA safety inquiry concerning signaling & communictions. W. F. Adams (left), counsel for SP assisted Nagel.

been fashioned by Congress, but beyond that outline, the ICC, and today the FRA, have been granted plenary powers to regulate signal safety. Congress has not delegated specific duties to the FRA — rather, in large measure, it has delegated broad discretion to be exercised in the best judgement of the agency.

My remarks today will encompass some of the concerns of Southern Pacific and, I believe, the entire industry with respect to the exercise of the discretion that has been delegated by Congress to the FRA to regulate railroad signal systems.

Railroad signal systems provide an unusual subject for government safety regulation. Signal systems themselves exist solely for the purpose of achieving safety; they perform no other direct function. In other areas of safety regulation the concern is over the level of safety attained by the railroads in the process of directly achieving other ends involving the provision of economical transportation services. But signals and those who plan, install and maintain them have only one purpose in mind — safety.

This fact, in our view, indicates that less rather than more government oversight is called for in the area of signal safety. No one can seriously claim that government regulators could do a better overall job in maintaining a safe system than the trained, professional railroad signal departments. We believe any time the judgement of government officials is substituted for that of the persons with primary responsibility, that there is a likelihood of negative results — however well-meaning were the government's intentions.

In reviewing the Federal Register notice of this hearing, it is our opinion that the very nature of the questions asked indicated that little consideration was given to the idea that less regulation might be the best regulation. The objectives of Executive Order 12044 seems to have been swept aside. With the exception of one or two questions, the requests for submission and participation by interested parties ominously seem to contemplate additional regulations and restraints on the already over-regulated railroads. There is no specific mention whatsoever of any regulation that is considered by FRA for possible revocation.

We believe it is a well known fact that railroads are constantly working for a safer operation. Since the last major revision of the Rules Standards and Instructions in 1950, SP as well as the other railroads have made outstanding improvements. On SP alone these include among other things:

—Installation of over 2700 miles of traffic control system, some of which replaced dark territory.

—498 dragging equipment detectors.

—186 high water detectors.

—455 hot box detectors.

—96 derailed equipment detectors.

—38 rock slide detectors.

—Crossing warning systems at a rate of approximately 200 per year.

Each year these new crossing warning installations alone add to maintenance costs approximately a quarter of a million dollars over and above previous budget without considering the inflation effects on this budget.

This mention of the tremendous expense of maintaining these warning devices is only a hint of the ever increasing total cost of maintaining entire signal systems. With railroad industry profit margins as slim as they are, every dollar must be spent wisely. We believe that a sensible and minimally intrusive government regulatory policy would greatly assist the railroads in spending signal safety dollars wisely.

One area of regulatory change that is absolutely essential to achievement of more cost-effective regulation is FRA policy regarding signal modifications. Within the framework of the former ICC (now FRA) regulations the use of the wording "material modifications" has required FRA approval of any change in signal systems. The interpretation of this "material modifications" by FRA has made it mandatory for railroads to forget about virtually any changes without an application. Under these restraints railroads cannot make appropriate responses to changing conditions.

Over any period of time operational changes can drastically reduce the amount of traffic a particular line carries. Any signal system that was installed for traffic that previously existed, should be reduced in relation to the traffic reduction, as long as safety is maintained. A case in point on our property involves lines where at one time, traffic was of such density that many signals were installed for close following trains. Traffic on these lines has now reduced whereby the close operation of trains no longer exists. We should be able to remove as many signals as we desire, as long as a basic signal system still remains providing the safety that is required. No railroad should be required to spend ever increasing maintenance costs for such a system.

In such a situation the too closely spaced signals provide, in fact, a reduced level of safety because there are simply more things that can go wrong — having more unneeded signals unequivocally does not achieve more

safety. The FRA position on this matter to never permit responses to reduced traffic levels is simply untenable. In all cases this equipment and the people and money needed to maintain it can be far better utilized elsewhere.

While every railroad must attempt to spend its funds in the areas most in need of them. Southern Pacific would like to apply extra funds freed up by a more benign regulatory policy to the goals of replacing older signal systems with modern equipment, installing more underground signal cables in areas where pole lines are particularly susceptible to damage from trees or the elements and generally by seeking to make its system more reliable.

It must be apparent — and this is an insight that does not deserve to be buried in the middle of the lengthy record in this proceeding — the forefront of safety improvements in recent years has dramatically shifted away from simple fine tuning of the RS&I. We, as an industry, are grateful that in large measure the government has not chosen to regulate the installation of the innovative detection equipment previously mentioned or the employee training programs or any of the other areas which promise to further improve the impressive safety record of railroad signal systems.

Currently every new signal employee involved in the construction or maintenance of signal equipment undergoes two years of training which includes forty days exclusively devoted to formal classroom training. Employees hired prior to 1973 when this program for new employees was instituted are currently in the fourth phase of ten or more formal refresher courses covering virtually every phase of our signal operations.

A further program on Southern Pacific is directly aimed at systematically determining the causes of component failures. The goal of the program is to develop the ability to quickly spot recurring design, manufacturing or installation defects so that prompt corrective action can be taken. In the very near future, we expect to computerize our records in order to increase the speed of the detection process. It is expected that this program will help us to solve some of the vexing component problems associated with maintaining complex electronic and mechanical signal equipment.

Southern Pacific's statistical records in 1978 with false-proceed signals indicates that the small area remaining for improvement will be largely addressed by the on-going programs and employee training more than by any proposed modifications in the RS&I. Of the 15 reports of false-proceed signals, (1) three were checked but were found to be working, and were probably reported in error; (2) five were caused by outside influences such as lightning, wind, a single unexplained relay failure; (3) one was caused by vandalism; (4) four were caused by improper hook-up and (5) two were caused by improper maintenance including one instance where rodent damage to insulation was not discovered.

While these failures are exceedingly, and perhaps irreducibly, small in number, the Southern Pacific

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programs described above are directly aimed at the precise causes of those failures which possibly could have been avoided. Neither we nor the FRA can completely contain the forces of nature, but SP believes it is responsibly addressing both the component and human causes to make its system as safe as possible.

Southern Pacific honestly believes that further detailed government oversight could not realistically augment the existing programs.

The final topic of my remarks today concerns the RS&I and the restrictive interpretations that have been given them which are neither in the spirit of performance regulations or in the interests of safety.

One of our major concerns is the apparent deviation from the original purpose of the ST&C regulations. The original purpose was to achieve safety of railroad operations, and the regulations were originally applied to achieve this purpose.

The deviation from that purpose involves interpretations to the regulations that were based exclusively on the opinion of the field inspector with little or no regard to the original purpose or the specific language of the RS&I. An example of this change was encountered on our property include the application of Rule 236.334 as pertains to the latch-out device on switch machines. Even though the rule provides that contacts would be open in the latched-out condition, the interpretation was made that the contacts had to be open $\frac{1}{16}$". The safety factor is that the contact had to be open regardless of the size of the opening, whether it be less than $\frac{1}{16}$" or 1" or 1 foot. We could not convince the FRA of this fact and could not maintain this device under these circumstances and therefore had no alternative but to remove the device from our property.

A second item concerned Rule 236.386 covering the power restoring feature to style "M" type switch machines. Safety was not involved since this type of machine was never designed to have such a feature and in the remote event that the switch never reaches the desired position the signals are in their most restrictive

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condition. It was necessary for us to take this item to Federal Court before we could put it to rest.

Rule 236.334, the point detector rule, again was a problem, not concerned with safety portion of the rule, but how compliance would be checked on a system that was working. The Field Inspector's interpretation and ours were in conflict and again it was necessary to take this to Federal Court for confirmation of our interpretation.

Rules 236.204 and 236.402 were cited to us as being in violation with the installation of "D" or distant signals within our Centralized Traffic Control sidings. These signals had been in use on our property for many years with no question as to any compliance with the regulations. Until 1973, we felt the signals were an asset to train handling by the locomotive engineer, but because the most restrictive aspect they displayed was yellow and this was deemed a technical violation, we were required to remove them. Throughout the entire time these signals were in service, no accidents or injuries occurred because of their use and in fact safety was enhanced by their installation.

Rule 236.23, paragraph (c), involving proposed penalties in excess of a quarter of a million dollars was cited as the basis of a violation claim which had nothing whatever to do with safety. The use of the signal aspect that was cited had been on our property for over forty years without one single accident or incident and was reliably understood and followed by all concerned. Yet, because of an indiscriminate decision, we had to change the aspect on over 2700 miles of Centralized Traffic Control at a considerable expenditure of money, plus the training of all operating personnel to the new aspect.

Rule 236.301 has been involved on our property in many locations. The contention by FRA is that we cannot have a signal at the entrance to an interlocking which never displays an aspect more favorable than "STOP". At the locations involved, we have provided a signal displaying red or "STOP" for any movements into the interlocking from a track that normally has traffic in the opposite direction. The signals were lcoated at the interlocking limits and prevented a move that was going against the current of traffic from passing into and through the interlocking. We had not allowed this signal to clear since we felt that moves beyond the interlocking must be made only after additional protection has been established. The track that the move was being made into was only signaled for one direction which was the opposite from the signal in question. Our installations were completely safe in operation, since extreme precautions were necessary via our operating rules for a movement by these signals. We never had an accident at these installations some of which were installed prior to 1950. The corrective action requested by FRA to make these signals operative, in our opinion, was a complete disregard for safety. Allowing this signal to clear into a so-called dark territory without additional precautions created a possible hazard anytime a train moved by the signal. It was our opinion that we could not allow this and have therefore put additional otherwise necessary restraints in the operation of these signals and our operating rules.

We are now engaged in an extensive exchange of correspondence with FRA as pertains to an exactly similar situation located within Centralized Traffic Control. We are being cited for non-compliance to Rule 236.408 Route Locking for signals that are exact duplicates of those covered by 236.301 in interlocking. Again, safety in our opinion is being ignored in forcing us to change our system.

These are only examples of the way the RS&I which stress performance have been converted on an Ad Hoc basis into detailed, if unwritten, requirements adding **nothing to safety and constricting options as if they were** part of the regulations.

SOUTHERN PACIFIC RESPONSES TO QUESTIONS

1. The purpose of the S&TC regulations and orders is the achievement of safety of railroad operations. In light of this purpose, what are the principal factors which FRA should consider in revising them?

A. Since the only purpose of the regulations is safety, the only factor to be considered in the drafting of regulations is safety. Rules must also be flexible both in application and administration. Some other factors that should be considered should be cost effectiveness and practical application.

2. The S&TC regulations are intended to be minimum safety requirements. Do "minimum requirements" encourage lower levels of inspections, maintenance, testing, or repair of signal systems?

A. Minimum requirements have never been considered as such. FRA presumably has not forgotten that the ICC derived these rules in 1939 by simply adopting

then existing railroad signal rules with few changes. These rules prescribed good practices then and for the most part are prescriptive of good practices today. Railroad operating rules were never thought to be minimum standards and Southern Pacific does not consider the current FRA rules to be minimum standards today. In some instances they prescribe the only standard, in others they are merely a point of departure for other safety procedures, and in still others they lock-in past practices and may in fact discourage innovation as described below.

3. Do the existing regulations deter either the upgrading of existing signal systems that are obsolescent or obsolete or the initial installation of signal systems?

A. Yes. While upgrading is generally not discouraged, certain of the regulations do substantially deter initial installations. Some examples of this are regulations that were placed in effect when these rules were first instituted but left previous installations in the same areas without requiring them to conform. Two examples of these are Rules 236.12 which involves signals in connection with spring switch installations and 236.410 involving electrical locks in CTC territory. Both these regulations do not require installations installed prior to 1950 to comply. We have not found there is any measurable benefit to safety due to these ill-conceived requirements. Installations that were made prior to 1950 simply do not have any problems in safety of operation. The new regulations are causing excessive costs by the Railroad to install new and uncalled for systems. One of the most prevalent is the installation of an industrial trackage within Centralized Traffic Control that requires an electric lock whereas a great number may be installed right adjacent to the new one that do not require electric locks because they were installed prior to 1950. The excessive cost of electrically locked switches is a substantial deterrent to industrial sitings within CTC territory while making no discernible contribution to safety.

4. Are the existing regulations sufficiently framed as performance standards so as to encourage technological development of S&TC systems, devices, or apparatus? How could the regulations be made more flexible to allow for greater technological innovation without detracting from safety?

A. In general we feel that most of the individual rules could be compatible with performance standards as they now exist. We believe that one of the greatest problems is the inflexible interpretation by the FRA personnel as to what the existing regulation means. On our particular property this has been a matter of great concern, since over a period of years we have received interpretations that have caused changes in operating rules and involved a considerable expenditures of money to modify our system to conform to the new FRA interpretation. We believe that performance standards are intended to prescribe the desired result without restricting the potential means of achieving that result. FRA, in reworking the current regulations, should be highly sensitive to those desired results which may be achieved through different means. One of the few rules which is itself over written to preclude innovation by specifying only one of several potential means to achieve a result is Rule 236-307 (Indication Locking) which actually specifies the exact circuitry that must be installed when other designs can be demonstrated to be equally effective and much less costly to install and maintain. The AAR suggested change in this rule is a good example of the type of change that can turn a rigid design standard into a performance standard.

Inflexible interpretation of performance-type standards can have the same effect as design standards. If FRA field personnel seek to impose a particular solution to a signal problem, it is of no benefit to the railroads to have performance standards. In fact, these performance standards are a trap — and an expensive one — for the unwary.

5. There are currently no specified Federal requirements concerning the qualifications of railroad personnel who install, maintain, and test S&TC systems. Should there be such requirements, and if so, what should they be?

A. The Railroads and the Brotherhoods have set up complete training programs for all signal personnel and believe this has provided qualified training and no Federal requirement is required. We have serious reservations that the FRA could develop the level of training expertise necessary to actually improve upon the railroad expertise in this area.

6. In many areas, one of the major causes of signal problems is vandalism. Should additional circuit redundancy or other protective measures be required in areas with a high incidence of vandalism?

A. Do not believe that any additional circuit redundancy or other protective measures will handle vandalism. The only answer is for the police and the courts to provide proper and adequate enforcement and penalties for such actions. Additional circuitry will not deter the vandal who is bent on disabling a signal system; he will simply disable the additional circuitry as well. No level of security to signal systems is impregnable just as no bank safe is impregnable.

Railroads already use shatter resistant lenses which can usually remain functional after sustaining bullet holes which fail to shatter the bulb. High security locks are already used in high vandalism areas with cases made of heavier metal, but these measures only nominally challenge the ingenuity and resolve of the vandal bent on destruction.

8. In 1947, the ICC issued Order No. 29543 requiring the installation of a Block Signal System on any portion of railroad over which passenger trains are operated at

speeds of 60 or more miles per hour or freight trains are operated at speeds of 50 or more miles per hour and the installation of an automatic trainstop, train control, or cab signal systems on any portion of railroad over which trains are operated at 80 or more miles per hour.

(a) The FRA is considering incorporating the requirements of the Order in the RS&I. Is there any reason this should not be done?

(b) Are the speed restrictions adequate in today's operating environment? What other factors, if any, should be considered in determining whether signal systems are required to assure safety? For example, taking into account present operating conditions such as longer trains carrying more hazardous materials, should the maximum speed at which freight trains may operate in non-signal territory be changed?

(c) Should the maximum speed at which trains are permitted to operate in other than automatic trainstop, train control, or cab signal territory be changed.

(d) Should automatic train control be mandatory above certain speeds or under certain circumstances?

A. (a) We have no objection to including the requirements of Order 29543 in part 236.

(b) Believe that speed restrictions are adequate. When this order was issued, train operation was considerably different than now. Communication systems now provide complete communication between trains and on the same train. Installation of traffic control systems and automatic block systems has been made over many miles of additional railroad. All these have made for a safe train operation not requiring any further regulations. Safe operating speeds in non-signal territory are not susceptible to any single level since many other factors coalesce to determine the appropriate speed. On a day to day basis individual railroads are in a far better position to monitor and react to all of these factors.

(c) No change should be made to maximum speed.

(d) No change should be made to this requirement.

9. One of the requirements of Part 233 is the immediate reporting to FRA of each accident caused by the failure of any S&TC device. FRA recognizes the need to revise this requirement to conform to the Accident/Incident Reporting Requirements of 49 CFR Part 225. What other changes, if any, should be made in reporting requirements of Part 233?

A. The redundant reporting requirements should be eliminated. Since the question indicates that there are two separate recording bodies, we believe that these can be corrected by eliminating the necessity for filing a report for a false proceed signal and only report it to the local office of the FRA when such an incident occurs.

10. The current working definition of the term "discontinuance" is the cessation of an S&TC system on track that remains in service for any railroad operations. A "material modification" includes, but is not limited to, changes in the type of signal system, respacing involving removal of signals for reduction of maintenance costs, conversion of a power-operated switch or derail to one operated by hand or spring, and any series of discontinuances or modifications which do not individually require FRA approval but will eventually result in a change requiring FRA approval. What changes, if any, should be made as to what constitutes "discontinuance" or "material modification" of a signal system?

A. The discontinuance of a S&TC system on a track should be based on the factors that include changes in operation and possible elimination of the original need for the system. The S&TC system installed on some lines may have been required for a previously higher level of railroad operations and if that operation ceases or is substantially reduced, there is no reason why the railroad cannot remove the system without any requirement or regulation. In addition, there should be no need for requiring permission to make a change that does not change the system from a standpoint of safety. For example, it should not be necessary to obtain approval to change an automatic block signal system to a traffic control system, since both systems provide safety for train movements over a segment of track.

11. FRA recognizes that some situations such as derailments and abandonments make prior approval of "discontinuances" or "material modification" impracticable or unnecessary. Section 235.3 lists those circumstances in which prior approval is not now required.

(a) Are there other situations in which changes in signal systems should be permitted without prior FRA approval? What, if any, measures should be required to assure safety if prior approval is not required?

(b) What methods other than track circuitry could be used to provide protection on light density lines?

(c) The removal of any signal in an S&TC system is prohibited except to provide adequate stopping distances. Are there other circumstances in which removal of individual signals should be allowed without prior approval?

A. (a) Many occasions will arise whereby changes should be permitted without prior FRA approval. If the individual carrier which desires to do this could contact the local FRA representative, believe this should be sufficient authority for making changes without proceeding through the red tape and delay that is now required with formal procedures.

(b) We know of no other signal methods that can be used for this type of protection.

(c) As indicated in previous testimony there could be many reasons for eliminating signals and since these signals do cost money to maintain, should the railroad wish to reduce maintenance cost there should be no reason for not removing redundant or unnecessary signals since this removal would be totally unrelated to safety.

12. Sections 235.11 and 235.12 specify the contents required applications for approval.

(a) Should other data, such as circuit plans, be required? Should any of the present data requirements be reduced or eliminated?

(b) Should the starting and completion dates for the proposed changes be included in the application. Should each approval be conditioned upon completion of the change within a prescribed period following the scheduled completion date?

(c) In what circumstances should an application that does not contain all of the required information be accepted and processed?

A. (a) We do not understand how a further requirement to provide circuit plans could be helpful, since it has always been the contention of the FRA that they do not have personnel available to review the plans and therefore must rely upon the individual railroad to provide proper circuitry.

(b) Starting and completion dates are generally not available since it is very doubtful when approval of application will be granted and the starting and completion dates are contingent upon this approval. We are never sure what year a project will obtain FRA approval much less the precise dates.

(c) We believe that only the FRA can determine whether an application is deficient or not, but the FRA should be mindful that minor omissions can be filled in during the approval process.

13. Notices of applications for approval of material modifications are mailed to each individual or organization that has requested inclusion in a central mailing list. Should these notices be published in the Federal Register instead?

A. We believe that the elimination of the public notice and adopting a standard whereby the application would be published in the Federal Register would provide a better means of handling applications.

14. Are certain requirements of the RS&I of such importance to sound signal engineering principles that applications for waiver should require a greater showing of need for relief? Should additional proof of safety, such as a safety analysis of the proposed system be required in these cases?

A. If the regulations were correct in the first place and covered every possible contingency, there would not be any need for requests for waivers. Railroads would be pleased to provide a "safety analysis" for waiver requests in every case where the original rule was drafted in light of a complete cost-benefit safety analysis.

15. The territory for which a signal maintainer is responsible may be extensive. Hence, a trouble call may arise at some distance from where plans are kept. Is there a need to require the plans to be kept at more accessible locations?

A. This question is directed toward a very remote problem on Southern Pacific. Where plans are kept is not, in my opinion, connected with safety but is only involved with the efficiency of the maintenance personnel.

16. During changes in signal systems, circuit changes are marked in color or symbolically. Should use of plans so marked be permitted subsequent to the completion of the changes?

A. As long as plans are legible, we see no problems as far as safety is concerned using color or symbols.

17. Problems of interpretation have arisen concerning the meaning of the words "undue delay". In general, FRA has taken the position that immediate action must be taken to assure the safety of train operations, but that adjustment, repair, or replacement of components may sometimes be deferred for a short time until parts or personnel are available. That is, FRA has recognized that temporary additional safety measures may permit traffic to continue over the line prior to completion of the necessary repairs and adjustments. However, in some cases any delay is "undue", and immediate repairs must be made.

(a) How should Section 236.11 be amended to specify when these repairs and adjustments must be completed?

(b) Should explicit time requirements be set forth for correction of various categories of signal failures?

(c) In view of the fact that a "false restrictive" indication could be caused by a ground or a broken rail, should railroads be required to investigate immediately each "false restrictive" indication and to take appropriate remedial action?

(d) What is the current practice of individual railroads concerning the investigation and correction of "false restrictive" indications?

(e) Should Section 236.11 address system failures, as well as component failures?

A. (a) We do not feel that 236.11 should be amended since this present regulation is well understood and there

is no conflict as to compliance. All railroads take corrective action as soon as the men and materials are available.

(b) Specific time requirements for correction are not feasible and we do not understand how this could affect the safety of train operations.

(c) No, we do not agree, since any restrictive indication would reduce train operations and repairs by the railroad would be done to eliminate train delays.

(d) Failures of this type are an expense to the railroad since they delay trains, and railroads requiring an efficient operation, correct accordingly as quickly as is practicable.

(e) As indicated above, efficient operation of the railroad requires that appropriate repairs be made. System failures obviously already receive correspondingly greater attention than a single component.

18. Should FRA prescribe performance standards for solid state equipment used in S&TC systems?

A. Existing regulations require that these systems meet certain standards and do not feel that any more regulations are required to specifically deal with solid state equipment. This is the very concept of performance standards.

19. Should FRA require a safety analysis of all solid state equipment?

A. Do not feel that any analysis of this equipment is required since the railroad and the manufacturer have handled this problem between themselves.

20. Section 236.8 requires that electromagnetic equipment be maintained within the limits in which it is designed to operate. Should this requirement be extended to solid state equipment?

A. We believe that existing regulations cover tests or the manufacturers recommended test cover this question very adequately.

21. What, if any, inspection and testing requirements should be prescribed for solid state equipment?

A. Present regulations covers this very adequately because they are already performance regulations.

22. A large number of requests for waiver of requirements of the RS&I involve placement or roadway signals (Section 236.21). Many of these waiver requests are granted because the prescribed placement of signals to the right of track is often impractical or not required for safety of operation. How can this placement requirement be changed to eliminate the need to file those waiver requests?

A. There is no need to maintain the present Rule 236.21 as it exists. We believe that it should be revised to read: "each roadway signal shall be positioned in a line so that the aspect of this place can be clearly associated with track it governs."

23. The spacing of roadway signals (Section 236.24) is based upon braking distances of maximum tonnage trains operating at track speed. There are no industry-wide standards for train stopping distances. Should FRA establish uniform standards to assure that signals are adequately spaced?

A. With the number of variables involved in stopping trains, together with the multitude of environments in which each railroad operates, believe such standards would be completely impracticable.

24. Due to improper location of a signal with respect to insulated joints, a locomotive may occupy a block without shunting the track circuit. Where route locking is provided, protection is given by requiring that route locking be effective before the first set of wheels of the locomotive has passed more than 13 feet beyond the signal governing its movement. (Sections 236.302 and 236.402). Should other signals be required to display their most restrictive aspect before the locomotive has passed more than 13 feet beyond them?

A. We do not know of any specific situation that would require this item to be made a part of the regulation.

25. Should standards be developed to prescribe the maximum permissible foreign current in track circuits?

A. The problem of foreign current is not what the railroads produce, but what outsiders produce and any regulations should concern them, not the railroads.

26. Section 236.51 requires that a track circuit be de-energized under certain conditions.

(a) Should the removal of a crossing frog be one of those conditions?

(b) The track circuit must be de-energized when a car occupies the fouling section of a turnout. Problems occur when the limits of the fouling section are not sufficient to safely accommodate the overhang of certain equipment beyond the nearest wheel contact point. Should FRA prescribe minimum standards for clearance points?

A. (a) The removal of the crossing frog involves considerable effort and present protective measures are adequate for train operation.

(b) Existing specifications are adequate.

27. The existing regulations for wires carried over pole lines require only that they be tied in on insulators (Section 236.71) and that sufficient clearance be provided where persons are permitted on top of cars (Section 236.72).

(a) Should FRA prescribe other safety requirements for pole lines?

(b) Section 236.108 sets minimum allowable resistance standards for wires other than those carried over pole lines. Should FRA prescribe minimum allowable resistance standards for wires carried over pole lines?

A. (a) Present regulations are adequate.

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(b) We see no need for requiring a specified resistance for line wires.

28. Are railroad inspection and test methods adequate or should FRA prescribe uniform requirements for the performance of each inspection and test?

A. We believe that inspection and testing should be left up to the individual railroads since there are many ways to make any test or inspection and still comply with regulations. As always, it is performance that counts.

29. There are no requirements for the performance of operating tests to determine whether a device or apparatus functions as intended.

(a) Errors in connection or adjustment of devices are a frequent cause of false proceed signal failures that could be avoided by proper operational testing after installation or adjustment. Should operating tests designed to determine whether a device or apparatus functions as intended be required subsequent to installation or adjustment?

(b) Should operating tests also be required periodically?

A. (a) This is industry standard practice and therefore no regulation is necessary.

(b) The same answer (a) is applicable.

30. Grounds are a major cause of false proceed signal failures but are not subject to periodic testing. Should such tests be required?

A. A ground check should be considered and I would concur with the AAR recommendations for this particular test.

31. The frequency of the various periodic inspections and tests required of S&TC equipment is specified in the following subsections of Part 236: 102-.108, 376-.387, .476, .576, .577, .588-.590.

(a) Certain equipment such as semaphore signals and relays and mechanical interlockings, is no longer manufactured. Does the age and failure potential of this obsolete equipment make more frequent inspection and testing necessary to assure safety?

(b) Are there newer and improved types of equipment that needs less frequent inspection and testing?

(c) Within the past five years, there have been two major accidents involving fatalities caused by defective bridge locking. Considering the accident history and the stresses, usually imposed on such moving parts, should movable bridge lockings be tested more frequently than annually (Section 236.387)?

A. (a) & (b) The AAR is submitting a change in the frequency of tests and inspections and I would concur with their proposal since it takes into account the type of equipment and practical experience with this type of equipment.

(c) We are not familiar with the failures that caused the accidents in question; but all of our installations of bridge interlocking have adequate protection and do not feel that any new regulations are required.

32. Testing of approach locking, time locking, time releases, and timing relays is required only in interlockings. Should the testing of these devices used in other S&TC systems also be required?

A. It has always been our opinion that this type of testing is required for traffic control system as well as interlocking and we have followed this practice.

33. Records of the required tests must now be filed in the office of the division in which the tests were made (Section 236.109). Should additional locations be allowed? How long should these records be retained?

A. We do not feel any additional locations are required and the only requirement for retention should be the latest records.

34. Section 236.204 requires in part: "In absolute permissive block signaling when a train passes a head block signal it shall cause the opposing head block signal to display an aspect requiring a stop." This requirement permits opposing trains operating on the same track to meet at locations where there is no siding. Should 236.204 be amended to require that whenever a train passes a head block signal "it shall cause the opposing head block signal at the next siding to display an aspect requiring a stop."

A. We do not feel that any changes are necessary since the present regulation is adequate.

35. Are the current regulations governing interlockings appropriate for the present railroad environment?

A. Yes, we do not see any need for additional regulations.

37. Section 236.313 sets forth specifications for pipe used in operating connections at interlockings. Are these specifications appropriate? Should there be similar

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specifications for pipe in all S&TC systems?

A. The use of pipelines is not a major item and we do not see any need for change. Welding could be considered as an alternate to rivets.

38. Section 236.401 specifies the automatic block signal and interlocking standards that are applicable to traffic control systems. Are these standards adequate?

A. Provisions applying to traffic control systems are adequate.

39. Should FRA specify where signals must be provided in traffic control systems?

A. No. Many factors are involved and determine where signals are needed, this can only be done by the carrier by reviewing each installation. Each carrier has certain operating requirements which must be considered.There is no way that any FRA specifications could satisfy all requirements.

46. Section 236.831(a) defines main track as excluding auxiliary tracks. Section 236.410 requires the use of an electric lock on switches on main track in traffic control territory where speeds exceed 20 miles per hour and train movements. FRA has always held that these requirements apply to signaled sidings. However, this has been challenged recently. The problem arose when the present definition of main track was adopted to prevent the application of Sections 236.502 and 236.504 to sidings. Apparently no consideration was given to the possible effect of this change on other sections. FRA believes that the following definition of main track: "A track, the use of which is governed by block signals, or upon which trains are operated by timetable or train orders, or both" together with appropriate amendment of Sections 236.502 and 236.504, would clear up the present confusion. Would these changes create other problems?

A. The proposed definition of the main track has always been associated with maximum timetable speed where sidings have not. The fact that sidings are signaled does not in any way constitute making this a main track. The FRA interpretation and the proposed change constitute an irreconcilable misuse of the terminology for the purpose of unnecessarily creating a design standard applicable to sidings.

48. Should all transmitting and receiving channels of remotely controlled locomotives and their controlling locomotives be tested prior to departure to ascertain that they function properly?

A. We make this particular test, and therefore, do not feel that any regulation is necessary.

50. Should a pre-departure test be required to verify that the feed valves on all remotely controlled locomotives automatically close following loss of continuity or application of the brakes on their controlling locomotives?

A. A test of this type is required by our ready track test and therefore no regulation is necessary.

51. Should physical deactivation of the command modules on all remotely controlled locomotives be required before their controlling locomotive is removed from the train consist?

A. We do not agree that this should be provided since it does not serve any purpose and no hazard is involved. It would be very time consuming and costly to the railroad.

In addition to all of the above questions, we are in accord with all of the revisions as proposed by the Association of American Railroads to the various Rules, Standards and Instructions and would expressly state that we feel the regulations as proposed to be revised by the AAR should be considered. This would eliminate many of the misinterpretations and provide a more meaningful set of regulations than now exists.

Part 3 of this special report on the Federal Railroad Administration's safety inquiry will be published in the next issue, June 1979. Material will be the suggested revisions to the Rules, Standards & Instructions for Signal Systems that have been prepared by the Signal Liaison Committee of the Communication & Signal Section of the Association of American Railroads.

Brotherhood of Railroad Signalmen will hold its 41st regular convention at the Pick Congress Hotel in Chicago the week of August 6-10, 1979

Military service may earn retirement credit says W. D. Best

In recognition of the service to the nation rendered by the many railroad employees who are armed service veterans, the railroad retirement laws allow certain periods of military service to be counted as railroad service for annuity purposes. The following questions and answers explain how veterans can receive credit under the Railroad Retirement Act for their military service.

(1) Under what conditions can my military service be creditable as railroad service under the Railroad Retirement Act?

You must have entered the Armed Forces either involuntarily *or* while the United States was at war or in a state of national emergency. Also, you must have worked in the railroad industry during the same year you entered military service or in the preceding year.

(2) In what war or national emergency periods must military service have been performed in order for the U.S. Railroad Retirement Board to credit it as railroad service?

Starting with World War I, creditable periods are:

- April 6, 1917, through November 11, 1918;
- September 8, 1939, through June 14, 1948;
- December 16, 1950, through September 14, 1978.

Military service that began between June 15, 1948, and December 15, 1950, or after September 14, 1978, or in any other period not included above, is creditable if you entered involuntarily. Also, if you entered the Armed Forces during a war period, any service you were required to continue in beyond the end of the war period is creditable.

(3) How can military service be used to increase a railroad retirement annuity?

If your military service is creditable as railroad service, you can get credit for a month of railroad service for each month of creditable military service. Earnings credits based on military service are then used in the calculation of both the tier I and tier II portions of your retirement annuity. The tier I portion is based on combined railroad retirement and social security credits and tier II on railroad service alone.

If your military service is treated as railroad service, a flat amount of $160 per month of creditable military service is credited as railroad compensation for years prior to 1968 and $260 per month for military service performed in the years from 1968 through 1974. For years after 1974, the amount of actual pay is creditable, subject to certain maximums.

If necessary, your military service credits could be used to meet the basic 120-month service requirement for a regular annuity, or the 25-year service requirement for a supplemental annuity, and/or other advantages.

(4) Can it be advantageous for my military service to be treated as social security credits?

If treated as social security credit, military service could help you qualify for social security benefits and in some cases also establish vesting for dual benefits, which could increase the total monthly benefits payable to you. It can also be advantageous to retired

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601 W. Golf Rd., Mt. Prospect, IL 60056

Name _____

Street or Box No. _____ **Apt. No.** _____

City _____ **State** _____ **Zip** _____

Lodge No. _____ **Certificate No.** _____

Here is an outline of Plan D:

HOSPITAL BENEFITS

$160 for the first 60 days (Medicare Deductible)
$ 40 per day from 61st through 90th day (Medicare Co-insurance)
up to $80 per day from 91st through 180th day.

MEDICAL EXPENSE BENEFITS

First $60 of the total of charges in a calendar year for

Surgery
Doctor's In-Hospital visits
X-Ray and Laboratory Examinations
Emergency Out-Patient Hospital Expense within 72 hours of an accident or surgery

MAJOR MEDICAL EXPENSE BENEFITS

$50,000 Maximum, with $1,000 automatic restoration each January 1.

Since Medicare benefits are taken into consideration in determining what will be paid under Major Medical, it is very important that all eligible persons be enrolled under Medicare in order to have the maximum possible insurance protection. Any person becoming eligible under Medicare, either because of attaining age 65 or becoming disabled at any age, must enroll under Plan D if coverage complementary to Medicare is desired. If an employee with two or more dependents, one of whom is eligible under Medicare, wishes to provide coverage under GA-23111 for all of his dependents, he must enroll for Plan D coverage for the person eligible under Medicare in addition to enrolling for coverage under Plan A, B or C for the remaining dependent(s) in order to obtain coverage for all dependents.

Shown below is a Medicare Authorization form which, when completed by eligible persons and sent to The Travelers will allow prompt handling of claims involving Medicare benefits.

Name of Medicare Insured–Employee
FI | MI | LAST

Health Insurance Claim Number (Include Any Letters)

Employee–Social Security Number or Railroad Retirement Board Number.

AUTHORIZATION: I authorize The Travelers Insurance Company to release to The Travelers Insurance Company any information which is required to act on a claim under my complementary health insurance policy and permit a photostatic or other facsimile reproduction of this authorization to be used in place of the original. This authorization is in effect until notice of revocation is received by The Travelers Insurance Company.

Signature of Medicare Insured (or Authorized Representative)–Employee

Date Signed

Name of Medicare Insured–Dependent
FI | MI | LAST

Health Insurance Claim Number (Include Any Letters)

AUTHORIZATION: I authorize The Travelers Insurance Company to release to The Travelers Insurance Company any information which is required to act on a claim under my complementary health insurance policy and permit a photostatic or other facsimile reproduction of this authorization to be used in place of the original. This authorization is in effect until notice of revocation is received by The Travelers Insurance Company.

Signature of Medicare Insured (or Authorized Representative)–Dependent

Date Signed

GI-46706

A separate form should be carefully completed for <u>each</u> person to be insured under GA-23111 who is also insured under Medicare.

The Health Insurance Claim Number may be obtained from each person's Medicare Health Insurance Card.

The signed Authorization(s) should be submitted with your enrollment form as it will allow The Travelers to process any future benefits for which you may be eligible under Group Policy GA-23111, using the information supplied by you and your physician in order for you to obtain Medicare benefits.

An active employee insured under Group Policy Contract GA-23000 or Group Policy GA-107300 may enroll under Plan D to provide benefits for his parents who are eligible under Medicare.

Military service may earn retirement credit says W. D. Best

In recognition of the service to the nation rendered by the many railroad employees who are armed service veterans, the railroad retirement laws allow certain periods of military service to be counted as railroad service for annuity purposes. The following questions and answers explain how veterans can receive credit under the Railroad Retirement Act for their military service.

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(2) In what war or national emergency periods must military service have been performed in order for the U.S. Railroad Retirement Board to credit it as railroad service?

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Lodge No. _____ **Certificate No.** _____

employees who still have minor or student children.

(5) How can I decide if my military service should be claimed as railroad service or social security credit?

Because of the complexities of the law, the Railroad Retirement Board will determine to your best advantage how your military service should be used. However, you have the right to claim it with either agency if you do not agree with the Board's determination.

(6) If I am eligible for benefits from the Veterans Administration, can my military service also be creditable for railroad retirement or social security benefits?

Yes, but if your military service is treated as railroad service, there may be a reduction in your railroad retirement annuity to prevent duplication, but your annuity will not be reduced below the amount payable if military service credits were not counted. If the military service is treated as social security credit, there is no military service reduction in either your railroad retirement annuity or social security benefit.

(7) I spent only 8 years in the railroad industry, but I was working for a railroad at the time I entered the Navy in 1965. Will this military service be creditable under the Railroad Retirement Act or under the Social Security Act?

If your total creditable service — rail and military combined — equals at least 120 months, you have the 10 years of creditable service required to qualify for an annuity under the Railroad Retirement Act. If you do not meet the 120-month requirement on this basis, your military service, as well as your railroad service, will be treated as social security credit.

(8) Can army reserve or national guard duty be creditable?

Your active duty training, summer camps and any call-ups to active duty may be creditable when the other previously described requirements are met. But service with the Merchant Marine is not creditable.

(9) Were retirement taxes deducted from my pay when I was in the Army?

Since 1957, social security taxes have been deducted from the pay of members of the Armed Forces. However, credit under the Railroad Retirement Act or Social Security Act is given for years before 1957, as well as after.

QUESTIONS AND ANSWERS AS TO ARTICLE IV July 27, 1978

Mediation Agreement

PART B. EARLY RETIREMENT MAJOR MEDICAL BENEFIT PLAN

Section 1.a. (General)

1. Question: Due to lack of information being provided, some eligible employees have been required to temporarily enroll in GA-23111 until at such time as his eligibility is determined or certified. Under these conditions, is the employee or the carrier required to pay the premium for coverage under GA-23111?

Answer: Steps have been taken to minimize any occasion for this in the future. Any one enrolling under GA-23111 does so at his own expense-but see answer to 2.

2. Question: Will an employee retired from service, fully qualified for the Early Retirement plan, who may have enrolled under Travelers GA-23111 and who may have had claim under such policy, be reimbursed for premiums paid under GA-23111 and have his claim payment readjusted?

Answer: It is understood that Travelers has extended assurance to individual employees and retired employees who have inquired as to their status that if they arrange for coverage under Group Policy GA-23111 and turn out to be covered by the Early Retirement Major Medical Benefit Plan, their premiums under GA-23111 will be refunded to them; that the premium refunds would be made from funds in connection with GA-23111 and not from funds under the Early Retirement Major Medical Benefit Plan; and if claims should have been incurred, appropriate "corrective" measures will be taken so that the claims will be recomputed under and charged to GA-46000 and GA-23111 will be relieved thereof.

3. Question: Under the circumstances cited in Question 1, what would be the status of an employee who did not, for reasons beyond his control, enroll in GA-23111 for the interim period?

Answer: His failure to enroll under GA-23111 will not affect his eligibility for coverage under the Early Retirement Major Medical Benefit Plan or his benefits under that Plan.

4. Question: Under Question 3, if the employee is required to pay the premium will he or she be reimbursed once eligibility has been certified? If so, by whom?

Answer: See answer to Question 2.

5. Question: Under the conditions cited in Question 3, what would be the status of the employee where it is later determined he is not eligible for coverage under GA-46000?

Answer: He is without coverage — during the entire period since his GA-23000 coverage ceased.

Section 1.a.(i) – Age Retirements

1. Question: As I understand, the agreement, among other things, provides that an early retiree must be 61 years of age on or after July 1, 1978 in order to qualify for benefits. If the man retires at age 60, no disability being involved, and is

qualified in every other way, can he pick up his benefits when he attains age 61?

Answer: No.

2. Question: What is the scope of the term "was covered for employee or dependent health benefits under the Railroad Employees National Health and Welfare Plan"?

Answer: It means — an employee who was covered by GA-23000 as an employee in active service, i.e., who had last worked or received vacation pay in a covered capacity not earlier than the preceding month and had since retired and not otherwise severed his employment relationship; he could have been an employee of a non-hospital association railroad in which case he would have been covered for employee and dependent health benefits, or an employee of a hospital association railroad in which case he would have been covered for only dependent health benefits.

3. Question: What is the purpose of requirement that employee or dependent must have had prior coverage under the Railroad Employees National Health and Welfare Plan?

Answer: 1. To provide coverage to the same employees as the Health and Welfare Plan covers;

2. To assure that only current active railroad employees are covered; and

3. To avoid a gap in coverage as between the Health and Welfare Plan and the Early Retirement Major Medical Benefit Plan.

4. Question: Is provision made for employees of railroads not party to the Railroad Employees National Health and Welfare Plan to participate (on a craft basis or other delineated group) in the early retirement health program?

Answer: No.

5. Question: Would an employee over age 61 and covered under GA-23000 with 29½ years of service (354 months) and thereby eligible for a retirement annuity under the 60/30 provisions of the Railroad Retirement Act, be considered eligible for the retiree health coverage?

Answer: Yes, if he fulfills other coverage requirements (applies for Railroad Retirement annuity after July 1, 1978, and has a current connection and is covered by GA-23000 the day before such application). However, his benefits will not become effective before August 1, 1978.

Section 1.a.(ii) – Disability Retirements

1. Question: If an employee is awarded a disability annuity at age 59 and qualifies in every other way (30 years — actual service plus post-service disability, current connection, etc.), is he covered when he attains 61 years of age?

Answer: Yes, provided he

(1) was disabled as of his annuity date, and has continued to be disabled thereafter;

(2) had a current connection with the railroad industry when he became disabled;

(3) was covered, at least for employee major medical expense benefits, under GA-23000 (or would have been so covered if he had been an employee of a non-hospital association railroad) until the later of

(a) August 1, 1978, or

(b) the date he attained 61 years of age.

2. Question: Is it contemplated an employee under the major medical coverage only of the extended benefits provisions of GA-23000 (and meeting age and service requirements) is considered as eligible for the retiree coverage?

Answer: Yes.

3. Question: Is an employee eligible for coverage under GA-46000 under the following set of circumstances:

1) Was 61 years of age and had 30 years of service prior to July 1, 1978;

2) Had exhausted R.U.I.A. sickness benefits prior to July 1, 1978;

3) Was receiving a disability annuity on July 1, 1978;

4) Had a current connection with the railroad industry on the date immediately prior to date on which he began receiving a disability annuity;

5) On August 1, 1978 was receiving employee health benefits or was still eligible for such benefits under the disability waiver provisions, under the Railroad Employees National Health and Welfare Plan;

6) Retired on or after August 1, 1978 under the 60/30 provisions of the Railroad Retirement Act of 1974?

Answer: Yes.

Section 1.b. – Dependents Eligible

1. Question: In either of the cases cited in the Question No. 1 under Section 1.a. (i) — Age Retirements or Question No. 1 under Section 1.a. (ii) — Disability Retirements, does a dependent receive any coverage?

Answer: A dependent may be covered only if retired employee upon whom the dependent is dependent is eligible for coverage.

2. Question: In the case of an employee under the major medical extended coverage as in Question No. 2 under Section 1.a. (ii) — Disability Retirements, who becomes age 61 while so covered and whose spouse's coverage under GA-23000 had ceased, will his spouse become eligible as a dependent when he becomes eligible?

Answer: The employee becomes eligible at age 61 (but not before August 1, 1978) if he then meets all other requirements, and his spouse becomes covered in the situation outlined at the same time. The employee himself will not be covered until his own GA-23000 coverage ceases.

Section 1.d. – Duration of Coverage

1. Question: Will provisions be made that when coverage under this plan terminates for the employee, or dependents, they will be eligible to enroll for coverage under Travelers Policy Contract GA-23111?

Answer: It is understood that the labor organizations, which are the sole policyholders of Group Policy GA-23111, plan to arrange for eligibility for coverage under that group policy on the basis of immediately prior coverage under Group Policy GA-46000.

2. Question: Should this paragraph be interpreted as though it included the additional words "or become disabled":

If the employee predeceases dependent(s), or becomes eligible for Medicare by reason of disability, the date the employee would have become eligible for Medicare by reason of age if he had not died or become disabled.

Answer: Yes.

3. Question: Under what conditions will coverage for a non-disabled spouse of a deceased employee cease?

Answer: Coverage for the spouse of a deceased employee will cease on the earliest of any of the following dates:

(1) The date the deceased employee would have become eligible for Medicare by reason of age* if he had lived.

(2) The date the spouse becomes eligible for full Medicare coverage due to age* or due to disability.

(3) The date the spouse ceases to be a dependent of the retired employee, as defined in Group Policy GA-46000.**

(4) The date the spouse remarries.

(5) The date the spouse dies.

*Or would be eligible for Medicare, except for reasons of residence or citizenship.

**Same definitions of "dependent" as in Group Policy Contract GA-23000.

Section 1.e. – Benefits

1. Question: On the date a retired employee attains 65 years of age and his coverage and that of his dependents terminates, his wife (age 63) is subject to a temporarily disabling condition. Will her benefits be cut off as of the date of termination of coverage?

Answer: No. Provision will be made for extension of benefits in relation to that condition only, after coverage ceases, in such cases while the dependent continues disabled, but not beyond the end of the next calendar year after coverage ceased.

Section 2. – Administration

1. Question: What procedure is to be followed by an employee to obtain certification of his eligibility and when?

Answer: A procedure will be established, including necessary forms, for informing an employee before retirement as to eligibility. Any claims should be filed with the nearest Travelers claim office.

2. Question: What arrangements have been made by individual railroads for determining employee eligibility?

Answer: See Answer to Question 1 above.

3. Question: Will the employee be notified as to the type and scope of coverage? If so, when and how?

Answer: See Answers to Questions 1 above and 4 below.

4. Question: How are certifications as to eligibility, I.D. cards, descriptive booklets, etc., to be handled?

Answer: As soon as the final group policy language is settled, employee information and certification booklets will be prepared and certification forms, identification cards if they are decided upon, and other necessary information will be prepared and distributed. It is understood that in general the material would follow along the same lines as GA-23000. Distribution arrangements would necessarily have to be adapted to the retired employee program and geared to those who are and who may be retiring.

5. Question: Must an employee terminate his coverage under GA-23000 and enroll under the retiree plan in order to cover his spouse?

Answer: No enrollment is necessary for either the retired employee or his dependents. Coverage is automatic, if qualifying requirements are met, after GA-23000 coverage runs out.

Section 3. – Hospital Associations

1. Question: Does the commitment " . . . to provide benefits similar to those provided by the plan . . . " mean without additional cost to the individual employees?

Answer: Yes.

2. Question: The last sentence of this Section states, (1) that where an employee did not belong to the hospital association, or left it after retirement, and the hospital association participates in the national plan, the employee will not now be eligible for coverage; and, (2) where an employee who belongs to the hospital association but the hospital association does not participate, the employee may not opt for hospital association coverage.

In (2) above, is it to be understood that an employee belonging to a hospital association may not forego the Early Retirement Plan entirely in order to participate in such plan as the hospital association may now have for retirees at their own expense and will have the ultimate effect of phasing out retiree coverage by such hospital associations?

Answer: An employee of a railroad, which for purposes of the Railroad Employees National Health and Welfare Plan is a hospital association railroad, but on which the hospital association elects not to furnish the commitment referred to in Section 3 of Article IV Part B, will automatically be covered by the Early Retirement Major Medical Benefit Plan on the national basis. He cannot get benefits from the hospital association at railroad cost by declining benefits under the National Plan. If he chooses to purchase at his own expense benefits from the hospital association through payment of dues or otherwise, that is not prohibited by anything in the Early Retirement Major Medical Benefit Plan except as it might be prohibited by something in the hospital association's own arrangements.

3. Question: Will an employee

as in (1) above who did not belong to the hospital association and the hospital association does not participate in (2) above, be eligible for the coverage which will be provided through Travelers?

Answer: No, because he neither belonged to a hospital association nor was covered under GA-23000.

PART C. DENTAL BENEFITS

Section 2.c. – Extended Coverage

1. Question: Would an employee and dependents covered by virtue of the extended benefits provisions of GA-23000 who would not be covered for dental plan benefits because of there being no extended benefits, become eligible for dental benefits on November 1, 1978?

Answer: No. Such provisions are intended to apply to employees who because of disability did not work, or were placed on furlough, or were suspended or dismissed from employment, or who due to pregnancy which commenced while insured under the Dental Plan cease to render service, on or after November 1, 1978 (or such later date as the Dental Plan liberalizations became or become effective for his employee group).

2. Question: Would an employee who last performed service or received vacation pay in October, 1978, and thereby had coverage through November be entitled to the extension of benefits provisions which first became effective November 1, 1978?

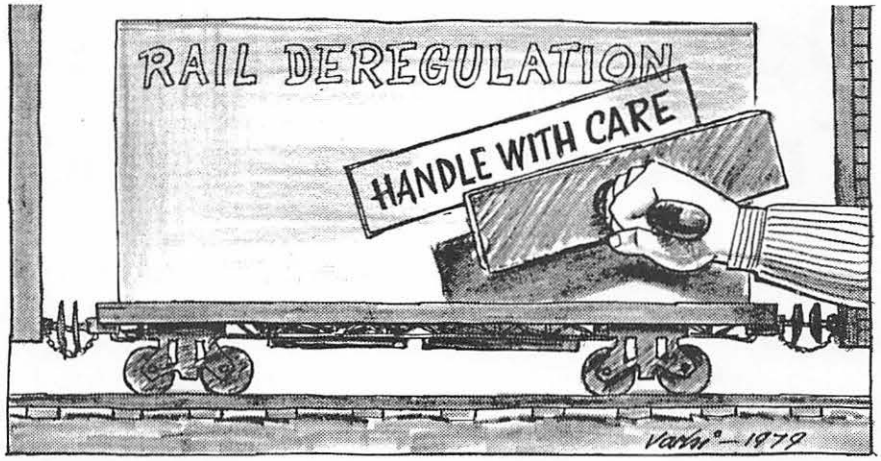
Answer: If the employee last performed service or received vacation pay in October 1978 and became disabled, whether in October or November 1978, and solely because of that disability did not work in November, he would be covered. If after having last performed service or received vacation pay in October 1978 he was placed on furlough, or suspended or dismissed from employment, in October, he would not be covered; but if the furlough, suspension or dismissal occurred in November 1978, he would be covered. See Answer to Question 1 above as to pregnancy absences.

3. Question: If extended coverage is to be provided as under the National Health and Welfare Plan, will the employee have coverage during the yearly period as under the major medical only coverage period under the National Health and Welfare Plan, and to what extent of coverage?

Answer: Disability coverage under the National Dental Plan will extend only until the end of the calendar year following the year in which the disabled employee last worked or received vacation pay. The Dental Plan provides nothing to correspond with the major medical expense benefits provisions of the Health and Welfare Plan, and consequently the additional year of extended benefit coverage is not a factor in connection with the Dental Plan.

Off-Track Vehicle Accident Benefit

1. Question: As of the effective date of the revision of the off-track vehicle accident benefit provisions, a certain employee was receiving a loss of time benefit ($100 per week, less RUIA sickness benefits, for up to 156 consecutive weeks). Should his benefit rate be increased from $100 to $150 effective as of such date?



Answer: The intent of the agreement provisions was that the date of the accident should be controlling with respect to the benefit rate. If the accident occurred on or after 90 days after the date of the Agreement involved, the increased benefit rates apply.

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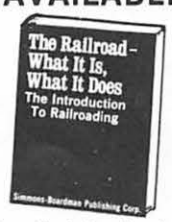

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Open enrollment set for Travelers insurance plans

OPEN ENROLLMENT FOR FURLOUGHED AND RETIRED EMPLOYEES

An open enrollment period in May, June, July, and August has been arranged by the Cooperating Railway Labor Organizations and The Travelers Insurance Company to make available coverage under Group Policy GA-23111 for those employees and their dependents (spouse and children over 14 days but under 19 years of age) not currently enrolled. During these months any retired employee or an employee who is on leave of absence, furlough or suspension with respect to his railroad employment and who while in active employment was insured under Group Policy Contract GA-23000 may enroll for the group hospital, surgical and medical plans available under Group Policy GA-23111.

The premium rates for the various types of coverage are shown on the enrollment form appearing at the end of this Article.

Furloughed employees of a hospital association railroad may enroll for dependent benefits only, unless such furloughed employees have discontinued their membership in the hospital association in which event they may also enroll for employee benefits.

No medical evidence of insurability will be required during the open enrollment for those not currently enrolled. In order to obtain the insurance, the only requirements are that the employee must have been covered by one of the active employee plans and submit a completed enrollment form with his check or money order for the required monthly payment before September 1, 1979.

Railroad employees described above may also insure their unmarried dependent children over 19 years of age but under 25 who are full-time students and unmarried dependent children over age 19 who are incapacitated by permanent physical or mental disability which began prior to age 19.

In addition, the widow and surviving children of an employee who was insured as an active, furloughed or retired employee are also eligible to enroll under Group Policy GA-23111.

Active employees may also enroll under Plan D of GA-23111 to provide benefits for their parents and parents-in-law who are eligible for Medicare.

For those signing up during this four-month period, the insurance coverage will become effective on the first day of the month following receipt by The Travelers of the completed form and the check for the required monthly payment.

There are five plans available; three for individuals not eligible for Early retirement or Medicare benefits, one for those who are eligible under Medicare and one for retired employees covered under the Early Retirement Major Medical Benefit Plan (GA-46000).

Plans A, B and C — For Persons Not Eligible For Early Retirement or Medicare Benefits

Plans A, B and C provide Hospital and Surgical Expense Benefits.

Plans B and C also provide Maternity Benefits, Medical Expense Benefits for doctor's charges for visits during hospital confinement, Radiation Therapy Benefits, Chemotherapy Benefits and Polio Expense Benefits.

Plan C only provides Supplemental Major Medical Expense Benefits in addition to the basic Hospital, Surgical, Medical, Radiation Therapy Benefits and Chemotherapy Benefits. It is important to understand, however, that the covered expenses considered under the Supplemental Major Medical Expense Benefits are limited to those expenses in the categories covered by the basic benefit provisions of Plan C as mentioned above. For example, reasonable Hospital room and board charges in excess of $55 daily or reasonable surgical charges in excess of the amount in the Schedule would be covered Supplemental Major Medical expenses. However, charges for drugs, private duty nursing, doctor's Home and Office visits, Lab and X-ray examinations, etc., which are not covered under the other benefits under Plan C would not be covered expenses under the Supplemental Major Medical Expense Benefits provisions.

Here is an outline of benefits available under these three plans:

	PLAN A	PLAN B	PLAN C
HOSPITAL BENEFITS			
Room & Board – Daily Benefit up to	$ 20	$ 35	$ 55
Room & Board – Maximum per confinement*	1,400	2,450	3,850
Hospital Extras and Emergency Out-patient, up to* (Including Ambulance service up to $25)	200	700	1,000
SURGICAL BENEFITS			
Per Schedule up to	300	450	550
Obstetrics	(Not Covered)	112.50	137.50
DOCTOR'S VISITS IN-HOSPITAL			
Per day of hospital confinement	(Not	5	5
Maximum per confinement*	Covered)	350	350
RADIATION THERAPY BENEFITS			
Per Schedule – Maximum per Calendar Year; or for any one injury or sickness	(Not Covered)	200	300
CHEMOTHERAPY BENEFITS			
Maximum per Calendar Year	(Not Covered)	200	300
POLIO BENEFITS	(Not Covered)	5,000	5,000
SUPPLEMENTAL MAJOR MEDICAL BENEFITS	(Not Covered)	(Not Covered)	50,000

*Successive confinements due to the same or related causes are considered as one confinement unless there is a complete recovery from the injury or sickness causing the earlier confinement.

Plan D – For Persons Eligible Under Medicare

Plan D supplements full Medicare benefits and provides Hospital, Medical and Major Medical Expense Benefits. The Hospital Benefit covers hospital expenses over and above those which Medicare provides during the first 90 days of confinement, but not in excess of the amounts shown in the outline below, plus hospital board and room charges for semi-private rooms up to $80 per day for an additional 90 days. The Hospital Benefit was liberalized January 1, 1979 to take care of the increase in the Deductible and Co-insurance amounts required by Medicare.

The Medical Expense Benefit pays the first $60 of the total of charges in a calendar year for surgery, doctor's in-hospital visits, X-ray and laboratory examinations, and emergency out-patient hospital expense incurred within 72 hours of an accident or surgery.

The Major Medical Expense Benefit is a very valuable part of this plan. After the insured person has paid the first $50 of expense incurred in a calendar year, the plan picks up 80 percent of reasonable "covered expenses" in excess of that $50, the benefits payable under Medicare, and the basic Hospital and Medical Expense benefits. The maximum payable as to each insured person is $50,000.

Here is an outline of Plan D:

HOSPITAL BENEFITS

$160 for the first 60 days (Medicare Deductible)
$ 40 per day from 61st through 90th day (Medicare Co-insurance)
up to $80 per day from 91st through 180th day.

MEDICAL EXPENSE BENEFITS

First $60 of the total of charges in a calendar year for

Surgery
Doctor's In-Hospital visits
X-Ray and Laboratory Examinations
Emergency Out-Patient Hospital Expense within 72 hours of an accident or surgery

MAJOR MEDICAL EXPENSE BENEFITS

$50,000 Maximum, with $1,000 automatic restoration each January 1.

Since Medicare benefits are taken into consideration in determining what will be paid under Major Medical, it is very important that all eligible persons be enrolled under Medicare in order to have the maximum possible insurance protection. Any person becoming eligible under Medicare, either because of attaining age 65 or becoming disabled at any age, must enroll under Plan D if coverage complementary to Medicare is desired. If an employee with two or more dependents, one of whom is eligible under Medicare, wishes to provide coverage under GA-23111 for all of his dependents, he must enroll for Plan D coverage for the person eligible under Medicare in addition to enrolling for coverage under Plan A, B or C for the remaining dependent(s) in order to obtain coverage for all dependents.

Shown below is a Medicare Authorization form which, when completed by eligible persons and sent to The Travelers will allow prompt handling of claims involving Medicare benefits.

Name of Medicare Insured–Employee
FI | MI | LAST

Health Insurance Claim Number (Include Any Letters)

Employee–Social Security Number or Railroad Retirement Board Number.

AUTHORIZATION: I authorize The Travelers Insurance Company to release to The Travelers Insurance Company any information which is required to act on a claim under my complementary health insurance policy and permit a photostatic or other facsimile reproduction of this authorization to be used in place of the original. This authorization is in effect until notice of revocation is received by The Travelers Insurance Company.

Signature of Medicare Insured (or *Authorized Representative*)–Employee | Date Signed

Name of Medicare Insured–Dependent
FI | MI | LAST

Health Insurance Claim Number (Include Any Letters)

AUTHORIZATION: I authorize The Travelers Insurance Company to release to The Travelers Insurance Company any information which is required to act on a claim under my complementary health insurance policy and permit a photostatic or other facsimile reproduction of this authorization to be used in place of the original. This authorization is in effect until notice of revocation is received by The Travelers Insurance Company.

Signature of Medicare Insured (or *Authorized Representative*)–Dependent | Date Signed

GI-46706

A separate form should be carefully completed for each person to be insured under GA-23111 who is also insured under Medicare.

The Health Insurance Claim Number may be obtained from each person's Medicare Health Insurance Card.

The signed Authorization(s) should be submitted with your enrollment form as it will allow The Travelers to process any future benefits for which you may be eligible under Group Policy GA-23111, using the information supplied by you and your physician in order for you to obtain Medicare benefits.

An active employee insured under Group Policy Contract GA-23000 or Group Policy GA-107300 may enroll under Plan D to provide benefits for his parents who are eligible under Medicare.

In order to enroll, simply fill out and sign the enrollment form reproduced below. A widow should show "Mrs." with the given name of her deceased husband.

Mail the completed enrollment form with your check or money order to The Travelers Insurance Company, P.O. Box 3002, Group Department, Railroad Division, Hartford, Connecticut 06101. Persons eligible for Medicare should also send a signed copy of the Medicare Authorization form to The Travelers with their enrollment form.

GA-23111

This Completed Form Together With The Required Payment Is To Be Sent To:

The Travelers Insurance Company, P.O. Box 3002
GROUP DEPARTMENT–RAILROAD DIV.–HARTFORD, CONN. 06101

NAME OF EMPLOYEE *(Please Print)* Last First Middle Initial	EMPLOYEE SOCIAL SECURITY NO.	DATE OF BIRTH EMPLOYEE Mo. Day Yr.	DATE OF BIRTH SPOUSE Mo Day Yr.	EMPLOYEE HEALTH INSURANCE CLAIM NUMBER	DEPENDENT HEALTH INSURANCE CLAIM NUMBER

HOME ADDRESS OF EMPLOYEE No. and Street City State Zip	REPRESENTED BY WHAT UNION?

NAME OF EMPLOYER (RAILROAD)	DEPARTMENT	DIVISION	LOCATION	EMPLOYEE NO.	DATE LAST WORKED Mo. Day Yr.	DATE OF EMPLOYMENT

If you and/or your dependent(s) are covered by medicare as a result of disability, please attach a copy of the medicare card(s).

If disabled at date last worked, please so indicate.

REASON FOR LEAVING ACTIVE EMPLOYMENT

☐ RETIRED ☐ DISABLED Date applied for Railroad Retirement Annuity_____. Mo. Day Yr.

☐ PREGNANCY ☐ SUSPENDED ☐ TERMINATED ☐ DEATH _____ Date

☐ FURLOUGHED ☐ LEAVE OF ABSENCE

If an enrollment form is being submitted for a student child, incapacitated child or parent(s) it is necessary that such person(s) full name and date(s) of birth be shown below. If this information is not completed, the enrollment form cannot be accepted.

☐ STUDENT CHILD ☐ INCAPACITATED CHILD ☐ 1 PARENT ☐ 2 PARENTS ☐ DATE(S) OF BIRTH _____

Name and address of student child, incapacitated child or parent(s) for whom enrollment is being made

GA-23111

PERSON(S) TO BE INSURED	REQUIRED MONTHLY PAYMENT				
	Persons Not Eligible Under Medicare			PLAN D Each Person Eligible Under Medicare	PLAN E Persons Eligible Under Early Retirement Major Medical Plan
	PLAN A	PLAN B	PLAN C		
Employee only	☐ $ 6.65	☐ $17.19	☐ $56.00	☐ $23.00	☐ $13.50
Dependents only or Widow and/or Children	☐ $ 7.76	☐ $17.19	☐ $56.00	☐ $23.00	☐ $13.50
Employee and Dependents	☐ $14.41	☐ $34.38	☐ $112.00		☐ $27.00
Each Parent – Eligible under Medicare				☐ $23.00	
Student Child (age 19 to age 25)			☐ $3.00		
Incapacitated Child (age 19 and over)			☐ $5.00	☐ $23.00	

I understand that the benefits which I am subscribing to are those indicated by the required monthly payment checked hereon for the plan or plans as described in the pamphlet (Form GI-47635) furnished to me in connection with Group Policy GA-23111. I also understand that I will be notified directly by The Travelers Insurance Company of my acceptance and billed for my next payment.

_____ Signature of Employee

_____ Date

Plan E — For Persons Covered Under The Early Retirement Major Medical Benefit Plan

Plan E supplements the Railroad Employees National Early Retirement Major Medical Benefit Plan (GA-46000) for employees who retire at or after age 61 and on or after July 1, 1978 under the 60/30 provisions of the Railroad Retirement Act of 1974 and who become insured under GA-46000.

Generally, the Plan will pay, after satisfaction of a $100 deductible, 80% (65% for mental or nervous disorders while not confined as an in-patient in the hospital) of Covered Expenses not paid under the Early Retirement Major Medical Benefit Plan. For example, if an eligible person had $5,100 in covered expenses, benefits would be computed as follows:

Covered Expenses	$5,100
Early Retirement Plan (GA-46000) pays	4,000
Amount not paid by GA-46000	1,100
Less Plan E Calendar Year Deductible	100
	$1,000
	x 80%
Plan E pays	$ 800

As shown by this example, the combined benefits of the Early Retirement Plan and Plan E will pay 96% of covered expenses after satisfaction of a $100 calendar year deductible.

The Plan E maximum is $200,000 as to each covered person.

DO NOT BUY!

National Boycotts Officially Sanctioned by the AFL-CIO Executive Council

All trade unionists and their families are asked not to patronize the products and services of the unfair firms listed below. List current as of first day of month of publication. Subject to change.

AMERICAN BUILDINGS, INC.—METAL BUILDINGS
Metal structures including storage buildings, warehouses, etc.—UNITED STEELWORKERS OF AMERICA.

BARTLETT-COLLINS COMPANY—GLASSWARE
Glass products including drinking glasses, mugs, etc.—AMERICAN FLINT GLASS WORKERS UNION.

COORS BREWERY—BEER
AFL-CIO BREWERY WORKERS D.A.L.U. 366 is on strike at Coors Brewery in Golden, Colorado for decent working conditions.

CHARLES MANUFACTURING COMPANY—FURNITURE
Coffee tables, end tables and similar items—these are sold under the FOX brand name—UNITED FURNITURE WORKERS OF AMERICA.

CROFT METALS, INC.—HOME BUILDING PRODUCTS
Aluminum and vinyl doors and windows including storm doors and windows, bathtub enclosures, patio doors, ladders, camper products and building specialty products—UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA.

DAL-TEX OPTICAL CO.—PRESCRIPTION GLASSES, CONTACT LENSES, FRAMES
Eyeglass lenses, frames, contact lenses, sunglasses, safety glasses sold through optical retailers—INTERNATIONAL UNION OF ELECTRICAL, RADIO AND MACHINE WORKERS.

HUSSMANN REFRIGERATOR CO./PET, INC. PRODUCTS AND RETAIL STORES
Commercial refrigeration equipment and various products of Pet, Inc. including Pet dairy products, Old El Paso Mexico foods, Musselman Fruit products, Downyflake foods, Stuckey's Roadside Stores, 9-0-5 Liquor Stores (St. Louis), Vendome Liquor Stores (So. Calif.) and Hussmann Refrigeration display cases—UNITED STEELWORKERS OF AMERICA.

J. P. STEVENS & CO.—TEXTILE PRODUCTS
Sheets and pillowcases, carpets, comforters and quilts, table linen, hosiery, towels, blankets, fabrics, etc.—AMALGAMATED CLOTHING AND TEXTILE WORKERS UNION.

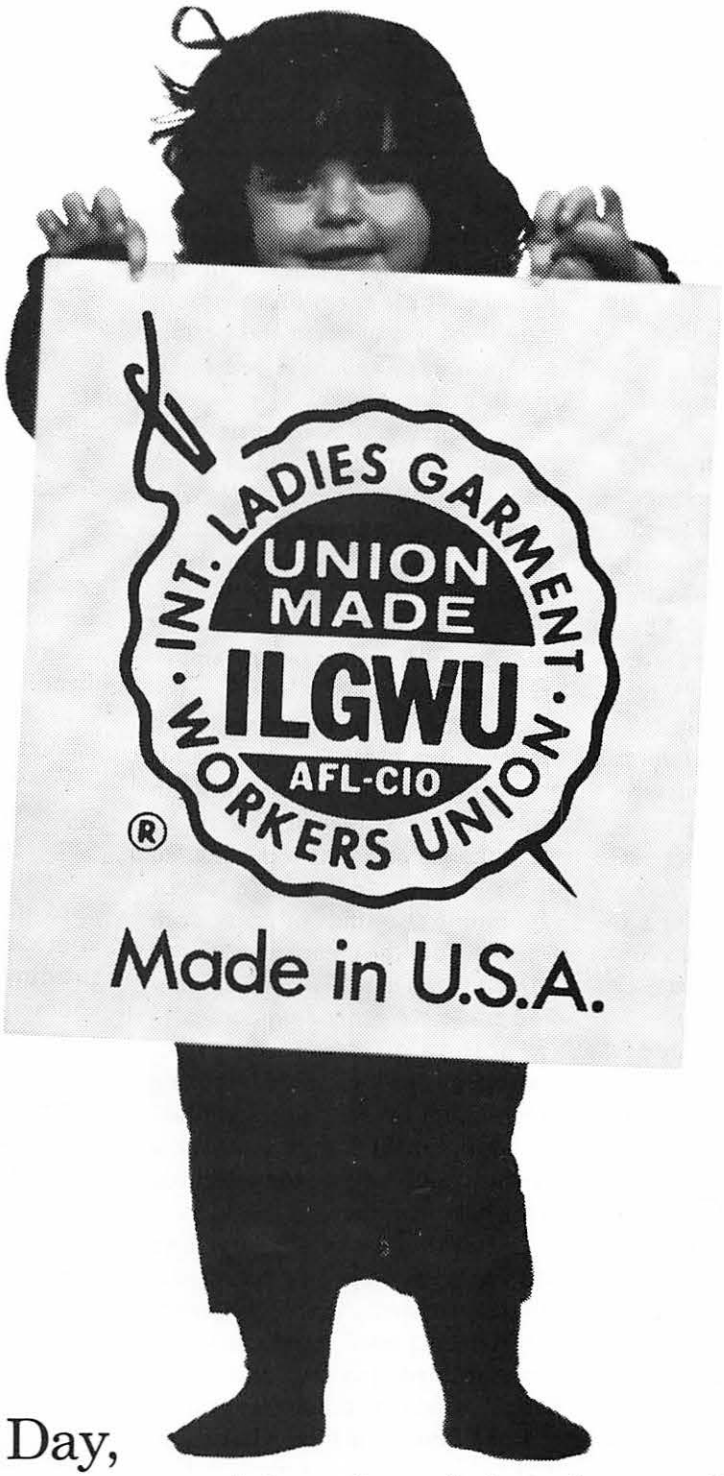
KINGSPORT PRESS—PRINTING
Book printer and its major customers including Field Enterprises Educational Corporation, publishers of *World Book, Childcraft.* Also, *Encyclopaedia Britannica,* Inc. including *Britannica, Jr.* and *Great Books of the Western World*—GRAPHIC ARTS INTERNATIONAL UNION; INTERNATIONAL PRINTING AND GRAPHIC COMMUNICATIONS UNION; INTERNATIONAL ASSOCIATION OF MACHINISTS; INTERNATIONAL TYPOGRAPHICAL UNION.

MASON-TYLER MANUFACTURING COMPANY—FURNITURE
Household furniture—UNITED FURNITURE WORKERS OF AMERICA.

R. J. REYNOLDS TOBACCO COMPANY—CIGARETTES & TOBACCO
Brand names: Winston Salem, Camel, Doral, Vantage, More, Now, and Real Cigarettes; Winchester Little Cigars; Prince Albert Smoking Tobacco—BAKERY, CONFECTIONERY AND TOBACCO WORKERS INTERNATIONAL UNION.

RYLOCK COMPANY, LTD.
Sliding glass doors, windows—INTERNATIONAL ASSOCIATION OF MACHINISTS & AEROSPACE WORKERS.

WINN-DIXIE STORES—RETAIL FOOD STORES
Food and grocery stores, including Kwik Chek and Buddies stores—BAKERY, CONFECTIONERY AND TOBACCO WORKERS INTERNATIONAL UNION; RETAIL CLERKS INTERNATIONAL UNION; AMALGAMATED MEAT CUTTERS AND BUTCHER WORKMEN.



For Mother's Day,
I'm giving Mom something her friends made.

If union families don't look for the union label, who will?

International Ladies' Garment Workers' Union
Union Label Department, 22 W. 38th Street, New York, New York 10010

HOW to BUY

By Sidney Margolius

Released by
Press Associates, Inc.

How you can get more for your food dollar

Generic-label foods and household products, also often called "no frills" or "no name," have swept across the country in recent months, with supermarkets in a number of cities now offering such products. They carry no brand name but are simply labeled "Cut Green Beans," "Vegetable Oil," or whatever they are.

Where available, such products are good values. Various surveys including our own comparisons, have shown that the generic or no-name canned and packaged foods often are 30-40% less than the national brands and even often 10-20% less than the same store's private or "house" brands.

Where stores also offer paper goods and cleaning products in the new generic brands, the savings may be even greater. We found only four such items, but they did average savings of about 50% of the price of the nationally-advertised brands.

But are these products just as good? Nutritionally and in eating quality the answer is an unqualified yes from all sources and experiences. In fact, sometimes the cheaper no-name foods even may be a little better nutritionally.

The main difference is that the generic products are usually the standard or medium grade, sometimes also called Grade B. The brand-name and house-brand versions more usually are "extra standard" or "fancy" grades, sometimes also called Grade A.

The chief difference between the lower and higher grades is in appearance. The lower grades are more likely to be less uniform and perfect in appearance, and have some uneven or broken pieces.

The higher grades have uniform size and fine appearance and color. But if you're mixing vegetables with other foods as in a stew or casserole, there's little point in paying more for the higher grades, since the vegetables take on the flavor of the other foods, and differences in appearance are lost anyway.

Sometimes the difference between the generic and higher-priced brands may consist simply of less sugar in some canned fruits, or less oil in mayonnaise, or "fruit mix" instead of "fruit cocktail," with a minor variation in the kinds of fruits, such as leaving out the cherries.

Besides the use of the lower standard grade, the generic products also are able to offer reduced prices because of savings on advertising expense and because stores are taking lower profit margins on these products, and limiting the selections to the basic varieties.

Consumer co-ops actually have had such "generic" or "no-frills" products for many years. The co-ops sell "Green Label" products which are standard quality, and "Red Label," which are the higher grade.

The difference in Green Label and Red Label pears, for example, is that the Green Label has some smaller and broken pieces while the Red Label are uniform in size.

But a recent "blind" test on a consumer panel sponsored by Mid-Eastern Cooperatives found that the tasters liked the Green Label as much as the more expensive grade, if not more so, since the pears were a little riper when packed.

Co-ops also have always called products by their generic rather than invented names. Co-op toothpaste is simply called "Toothpaste," not "Gleem" or "Close Up." Their "Liquid Household Cleaner" is called that, not "Mr. Clean" or "Janitor in A Drum." "Baby Shampoo" is called just that, not "No Tears."

The biggest savings we've observed so far on generic products are in household cleaners and paper products. Biggest savings in packaged foods are on canned corn, canned tomatoes, grape jelly, canned green beans, mayonnaise and salad dressing, peanut butter, vegetable oil, and tea bags.

If the present trend continues, and generic products prove to be more durable than just another competitive retail promotion, the development will have lasting value both to your family and to the national economy.

For one reason, processors will rely less on the obsolete grades which emphasize appearance and will pack more of the equally nutritious standard quality. Too, consumers will compare values on the basis of product and price rather than choosing the best-known names.

Similarly in buying products, don't be fooled by illusions of value. Consumers often pay more for appearance.

In fact, red-skinned apples are priced almost entirely according to the amount of red. The redder, the costlier. But color has no effect on taste.

Oranges with greenish skin, grapefruit with rust-colored splotches, onions more lopsided than round — all usually sell for less but have the same nutrition and eating quality.

Actually, small tomatoes often have a higher concentration of vitamin C than big ones that command a premium price.

Supermarket executives have become defensive about criticisms

that they entice shoppers to buy junk foods such as presweetened cereals and candy. The enticement lies in the way they place them around the stores.

There may be no special effort to sell junk foods as such. But our own surveys indicate that placement of items certainly encourages you and possibly your children to buy the costlier versions.

Stores use four main methods to stimulate impulse buying. These are (1) traffic patterns, or the way they lead you around the store; (2) the way they position items they want you to choose; (3) the bargain image, and (4) the appeal to your senses. This is done through packaging colors and shapes and such devices as pink lights sometimes used over the meat counter and artificial fragrances such as a roast beef odor in the meat department and a fresh bread smell in the baked goods area.

The traffic pattern most often used is placement of the meat department at the back of the store to lead you past other foods, including produce, which is more of an impluse item.

But for your own defense, positioning is the major suggestion-selling technique you ought to know about. Stores have found you are more likely to buy an item if it is positioned from your waist to your neck. Thus, you often find the more expensive items on the middle shelf or at hand or eye level, and the lower price staple items on the bottom shelf.

One store official recently defended this practice on the ground that the staples are restocked most often, and it's easier to restock the lower shelves.

Whatever the reason, the higher-priced products usually are more visible and easier to reach. We found such examples as the costlier presweetened cereals on the middle shelf and the lower priced unsweetened versions on the bottom shelf; the cheaper soups like tomato and cream of celery on the bottom and such costlier versions as meat alphabet soup on the middle shelf.

Similarly, the small expensive packages of sliced lunch meats often are at eye level while the less costly bulk pieces are lower down. We also found one supermarket chain, that uses upright freezers, placed the more expensive frozen vegetables packaged with sauces at eye level while the cheaper plain vegetables were on the lowest shelf.

Another chain reports it merchandises frozen vegetables by placing expensive impulse items next to fast-moving staples; for example, broiled mushrooms next to ordinary green beans. In breads, too, you may have noticed that often the lower priced staple loaves are on the bottom shelf.

Another positioning technique is to separate widely-bought staples; for example, putting milk at one end of the counter and eggs at the other so the shopper passes all the cheeses, yogurts and other costlier dairy products.

The most criticized practice has been placement of toys next to cereals or cookies where children are most likely to see and demand them.

The most important positioning method to be conscious of may be the end-of-aisle displays, both to take advantage of genuine bargains and avoid unplanned impulse purchase.

Cans at end of aisle

In a classic study some years ago, the U. S. Department of Agriculture found that sales of canned juices could be doubled by putting them on display at the end of the aisle, and people buy even more if the cans are jumbled to give a bargain image. Managers are well aware that they can stimulate sales of an item with an end-of-aisle display even at the same price, especially if they give it three facings.

In a study of our own, we found that end-of-aisle displays are worth observing for real values but often also include items of no special value, and impulse type snack foods and drinks.

Of 62 such displays, 27 were good values, offering genuine reductions on such staples as tuna fish, peanut butter, canned green beans, canned tomatoes and sauce, fruit juices, napkins, canned baked beans, coffee, salad dressing, cooking oil, stationery and motor oil.

Of the others, researcher Jane Harmon found that the most common were snack crackers, cookies, pretzels and potato chips, sodas, canned fruit flavored "drinks" (the kind that are 90% water and sugar) and beer. Other impulse type products often found in such displays include canned mushroom buttons, jellies, and cake mixes.

Despite the blandishments of both stores and manufacturers, consumers are making a surprising switch on several of the costlier and most controversial products: presweetened and so-called "natural cereals."

Industry officials have reported a sales decline on both these products. Many presweetened cereals are 30 to 60% sugar. They have become the center of a nationwide battle because of concern over the possible effects on children's health and teeth, and their high costs for their sugar content.

The Federal Trade Commission presently is investigating the sugar cereals because of the advertising directed at young children. In fact, the president of Kellogg recently blamed the decline in the previous booming sales of presweetened cereals on the FTC's "orchestration of some very misleading criticism by a few consumer activists."

But the facts are that the criticism has been going on many years while FTC got into the debate only this year, and the complaints have come from many people, not just "a few activists."

More likely, the expanding criticisms of the startling amount of sugar in some TV promoted cereals have made more parents aware, and they are passing the word on to their kids. Holes in teeth can be as convincing as Tony the Tiger.

Consumers also pay a much higher price for the sugar in cereals than they may realize. Recently we

compared several brands of the same cereals in presweetened and unsweetened versions from the same manufacturers. You could buy ordinary corn flakes and pay at the rate of $1.03 a pound. Sugar Frosted Flakes from the same manufacturer cost a similar $1.01 a pound.

But the unsweetened corn flakes contain only 7% sucrose and other sugars while the "frosted flakes" are 39% sucrose and other sugars.

So if you deduct the value of the actual corn flakes, you pay for the extra sugar in the sugar coated flakes at the rate of $1.03 a pound. You can, of course, buy ordinary sugar for 27 cents a pound.

In a time of record-high food prices, the federal government itself props up the prices of many foods through a little-publicized system of marketing orders that limit supplies.

The marketing orders are administered by the U. S. Department of Agriculture. They cover 31 fruits and vegetables, including such basic crops as potatoes, winter tomatoes, oranges and other fruits.

Under these marketing orders, the government can and does control the supply of many products going to market at a specific time, usually the seasonal peak, by regulating the size and grade which can be shipped. By limiting shipments of lower grades and smaller sizes, especially during the peak season, the USDA can reduce the available supply.

The use of marketing orders to control supplies, and thus keep up prices, began in 1933 during the big depression when farm prices were very low and supplies swung widely.

But the irony and damaging effect on consumers is that the system is still in use at a time when many of the regulated products are at record-high prices. A major beneficiary of the supply control system is food canners and processors. They are able to buy up at lower prices the smaller and less-attractive looking products kept off the consumer market.

The marketing limitations of most immediate concern to consumers are those regulating supplies of fresh oranges, grapefruit, tangerines and other citrus fruits. Consumers paying $1.70 a dozen for oranges and 50¢ for a six-ounce can of orange concentrate can hardly approve of the orders this summer, which limited shipments of California and Arizona citrus fruits and raised the grade requirements for shipments of Florida Valencia and other late-type oranges.

The USDA says the price-raising effect of limiting the grade or numbers of oranges that can be shipped is "minimal" because most Florida oranges are processed into frozen concentrated and canned juices. But the total effect of further limiting supplies of these and alternative citrus fruits when they already are in tight supply is damaging.

For example, a marketing order last spring limited shipments of Florida seedless grapefruits. This action was needed, says Charles Brader, deputy director, USDA Fruit and Vegetable Division, because of the heavy supply. It was accomplished by limiting the minimum size of shipments to 3 and 9/16 inches diameter. Only after May 8 could grapefruit as small as 3 and 5/16 be shipped.

But the fact is that the restriction helped keep up the cost of this commodity to moderate-income families. Even though grapefruit juice at this time costs about 25% less than orange juice, the price is higher than a year ago despite relatively large supplies.

In a year when prices of potatoes have jumped 25 to 30%, marketing restrictions also are damaging. Yet several orders this spring and summer raised requirements for grade, size, cleanliness, pack and maturity for shipments in a number of counties in California, Oregon, Washington State, Idaho and Colorado.

Potato shipments also may be restricted by blemishes due to mechanical injury. Brader points out that processors can use small potatoes or cut off blemished ends, etc. So consumers may still benefit from the lower prices the processors pay, he argued in an interview with this writer.

But consumers, too, could cut off blemishes if they could buy the less-perfect products at lower prices. That shoppers are happy to get mixed-size culls at reduced prices has been demonstrated by the popularity of special "bin" sales at the consumer co-ops in the Berkeley, CA, area. These stores have offered such bargains in recent years as cling peaches as low as 12¢ a pound.

Consumers who have been paying record prices for fruits this year also will be interested to know that shipments of peaches, nectarines, pears, apricots, prunes, plums and cherries often are restricted. Thus, minimum grade, size and container requirements for several types of Bartlett pears have been established for the period of July 12 to August 31.

To show you how unreasonable the shipping requirements can be, the USDA let Georgia peaches as small as 1 and ¾ inches diameter be shipped until May 15. That extension was granted because the new crop was late. Otherwise the smaller peaches would have gone off the consumer market earlier.

Then as the crop came in the government increased the minimum diameter to 2 inches. The announcements for these, as for other marketing orders, read: "Such action is designed to promote orderly marketing in the interest of producers and consumers." It's understandable if that explanation sounds hypocritical, but they've been using it for years.

As well as the federal marketing orders, a number of states also control supplies through their own marketing orders dictating size and grade that can be shipped. When California regulates shipments of peaches, or Washington State of apples, consumers throughout the nation are affected.

Apparently no crops are actually destroyed nowadays to withold supplies. A California state marketing order in 1970 included a "green drop" program for knocking peaches off the trees while still green. But that

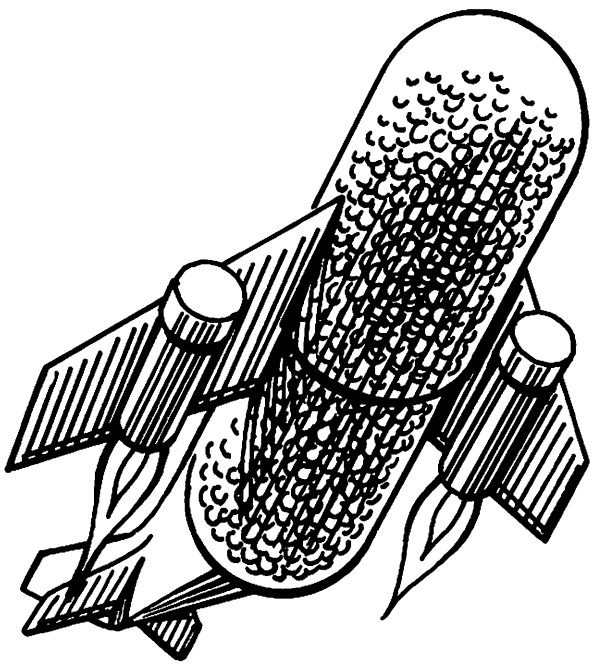
incident provoked so much criticism such steps haven't been taken since.

Similarly in 1970 and 1971, some of the cranberry crops were dumped because of heavy supplies, which raised a furore. So this won't be done again. Now an alternative marketing agreement provides for producer marketing allotments. In case of very heavy crops, participating producers could reduce shipments simply by withholding fertilizer or water from their fruit, or leaving them in the ground.

Milk is the only commodity on which the price itself is actually regulated. Federal milk marketing orders are especially notorious for setting higher prices which distributors must pay farmers for fluid or "drinking" milk than for milk used for manufacturing into cheese, ice cream and other dairy products. The excuse for charging manufacturers less than consumers for the same milk is that this is "surplus" milk.

A preliminary investigation by the Federal Trade Commission has found that milk prices are higher when the states set retail prices. (While more states have laws empowering state agencies to set prices, those exercising this authority as of a year ago when the FTC issued its report, were Maine, Montana, Nevada, New Jersey, North Dakota, Pennsylvania, South Carolina, South Dakota, Vermont, Virginia and Wyoming.)

But milk is still relatively cheap, and many fruits and vegetables this summer are not. Until the government revises the obsolete system of marketing orders, you'll do best by avoiding paying premium prices for perfect-looking produce and buying nearby produce in season.



Sick of Rising Medical Costs?

There's no pill to stop price increases. But union members can help identify unjustified price increases by checking prices every time you shop.

Clip out this form and take it with you the next time you shop. Compare prices for these items for a couple weeks, and then mail the completed form to: Operation Price Watch, AFL-CIO, 815 16th Street N.W., Washington, D.C. 20006.

The AFL-CIO will make certain these forms are given to President Carter's inflation-fighters, as proof that prices are going up while wages are held down.

You can copy this form and ask your friends and neighbors to check prices at other stores.

Name of Store: _____

Address of Store: _____ **City:** _____ **State:** _____

(Please report same items, same brands, same size or weight and same stores)

Drug Store Items	Brand Name	Price on	Price on
Vitamin C—100 tablets			
Aspirin—100 tablets			
Rubbing Alcohol—one pint			
Baby Oil, 10 oz.			
Band Aids—pkg. of 100			
Antacid—100 tablets			
Toothpaste—9 oz.			

Prescription Items	Brand Name	Price on	Price on
Penicillin—(400,000 units) tablets			
Phenobarbital (15 mg) tablets			
Antihypertensives (10 mg) tablets			
Ampicillin (100 cc) liquid			

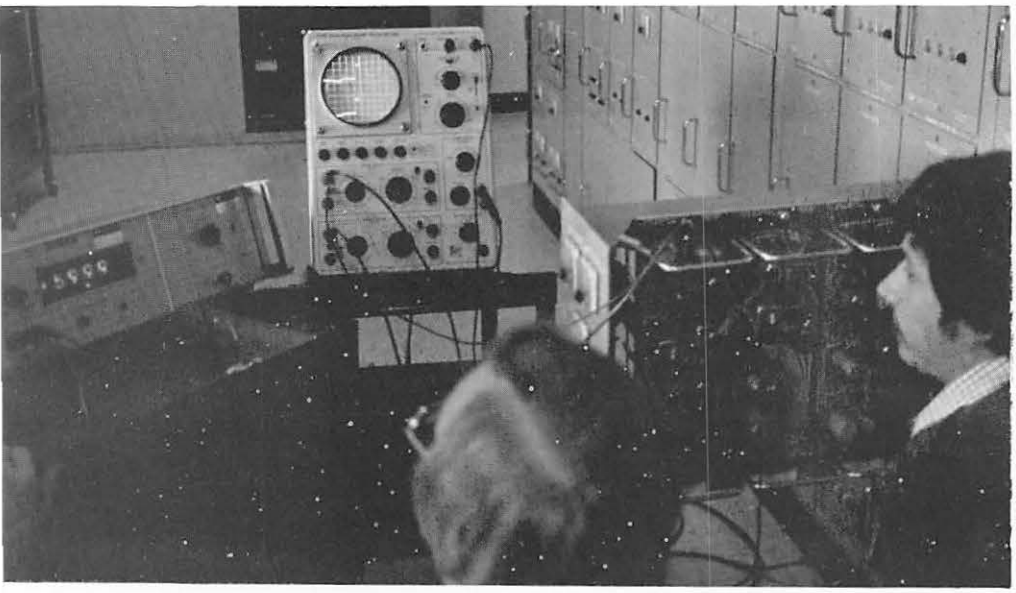
Your name: _____

Address: _____

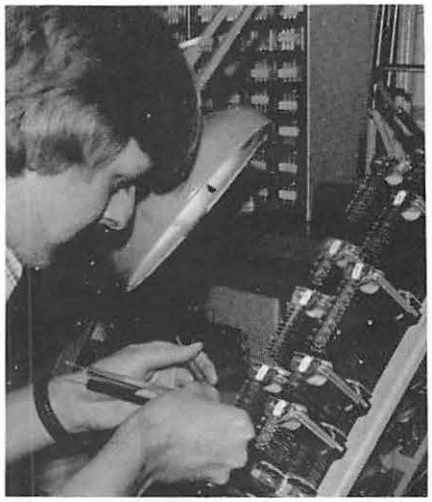
Electronic repair vital at CP yard

CP Rail's retarder classification yard at Agincourt, Ont. just east of Toronto, is an automatic yard using radar speed control and an analog computer. Upwards of 2,000 cars are handled daily.

Steve Richards, electronic technician, makes a test to see effect on the display panel.



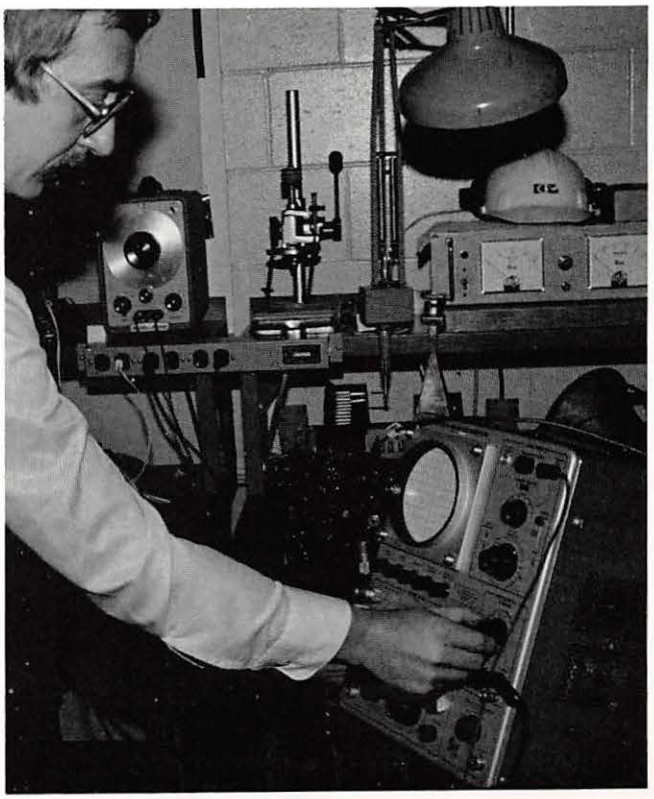
Michael Pawluch (left) intermediate electronic technician, and Michael Bruckner (right) senior electronic technician, use oscilloscope and digital counter to check operation of master speed storage unit.



Steven Richards adjusts relay contacts on one of the analog computer units.

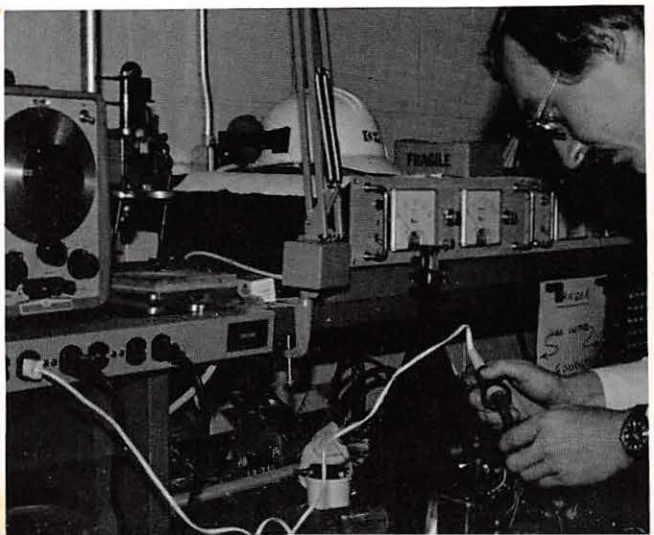
News from Canada

Michael Bruckner, senior electronic technician, uses digital voltmeter to check a computer storage unit.



Michael Pawluch, intermediate electronic technician, checks diodes for forward and reverse voltage characteristics.

Michael Pawluch makes a soldered connection in repairing a radar unit at CP Rail's Toronto yard.



FACT SHEET ON ASSOCIATED NON-OPERATING RAILWAY UNIONS SETTLEMENT

March 6, 1979

Wages:

	1978	1979	1980	1981	Compound increase over 1978 Avg. Wage.
Across the Board Increase in Basic Wage Rates		$.665	$.585	8%	
Equivalent Per Cent Wage Increase on Average Wage		10%	8%	8%	28.3%
Average Hourly Wage Rate	$6.65	$7.315	$7.90	$8.532	
C.O.L.A. Inflation estimate Average Annual Per Cent Increase		8%	6%	6%	21.3%
Inflation Increases as a Per Cent of the 1978 Average CPI (175.2) necessary to produce C.O.L.A. Payments		8%	14.5%	21.3%	
Average Annual CPI Required Before C.O.L.A. Payment	(175.2)	189.2	200.6	212.6	

Operation of the COLA clause

1 Year	2 Percentage increase in the Consumer Price Index over the 1978 CPI required before COLA payment.	3 Average annual percentage increases in CPI that produce the figures in Column 2.	4 Average annual CPI required before COLA payments are made. When these numbers are exceeded, a lump sum payment is made to employees at the end of the year.	5 Assumed average annual percentage increases in CPI are 9%, 8% and 8% respectively. If this is the case, it can be seen from column 3 that COLA payments will be made at the end of each year.
1978	—	—	175.2	—
1979	8%	8%	189.2	9%
1980	14.5%	6%	200.6	8%
1981	21.3%	6%	212.6	8%

Notes to table at left

Formula: For each 0.3 pts *over* the *"Average Annual CPI Required Before C.O.L.A. Payment"* there will be a 1¢ per hour increase in all rates, which will be paid as a lump sum at the end of each year.

If the 1981 Average CPI exceeds 212.6 all basic rates will be increased by 1¢ per hour for each 0.3 points above 212.6. Thus, C.O.L.A. payments in 1981 will be folded into the basic wage rates as of December 31, 1981.

For Canadian residents only:

Allow 6 weeks for change to take effect. Form ML-1 Rev. 6/67

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Tentative wage and fringe benefit agreement between the non-operating unions and the Canadian railways was signed in Montreal, Quebec on March 2. Shown here (from the left) are: J. D. Parnell, vice president, United Telegraph Workers; J. P. Larasse, manager, VIA Rail; and John E. Platt, vice president, Brotherhood of Railroad Signalmen.

6 Column 5 increases in CPI expressed as percentage of the 1978 CPI. Result from compounding figures in Column 5.	7 CPI that would exist if the percentage increases assumed in Column 5 took place.	8 Excess of points in Column 7 over Column 4. Shows number of points to which COLA formula will apply. COLA formula provides that an additional 1¢ per hour will be paid for each 0.3 points of excess in Column 8.	9 Additional cents per hour that would be paid assuming the excess of Column 7. The 1979 excess is 1.8 points. Thus 1.8 points divided by 0.3 equals 6¢ per hour.	10 Employee gets a lump sum COLA payment for 2080 hours worked at the end of the year. In 1979, the employee would get 6¢ per hour for 2080 hours or $124.80.
—	175.2	—	—	—
9%	191.0	1.8 pts.	6.0¢	$124.80
17.7%	206.2	5.6 pts.	18.7¢	$388.96
27.1%	222.7	10.1 pts.	33.7¢	$700.96

Food for Signalmen

This recipe for buns comes from Mrs. "Jackie" Gorlach, secretary to BofRS Secretary-Treasurer W. D. Best. Grand Lodge members can attest to the goodness of these buns.

1 Dozen Buns

1 cup water
2 tbsps. butter
¼ cup sugar
Bring the above to a boil and then after it cools a little beat in 2 eggs.

1 pkg. yeast
2 tbsps. water (luke warm)
4 cups flour
1 tsp. salt

Add yeast mixture to egg mixture and then add that to your flour. Let dough rise for two hours on the counter with a towel on top to keep warm. Then place in the refrigerator overnight. The buns have to rise for two hours after you form them so plan on forming them about 2½ hours before you want them.
Bake at 400 deg. F. 15 or 20 minutes.

Mrs. Edith Flowers, wife of Louisville & Nashville General Chairman Roy B. Flowers, furnished The Signalman's Journal with this recipe, guaranteed to delight the palate of those who enjoy fine southern cooking.

Bourbon Pecan Cake

2 cups whole red candied cherries
2 cups white seedless raisins
2 cups bourbon
5 cups sifted all purpose flour
4 cups pecan halves
1½ tsps. baking powder
1 tsp. salt
2 tsps. ground nutmeg
2 cups softened butter or margarine
2 cups granulated sugar
2 cups firmly packed dark brown sugar
8 eggs separated

Combine cherries, raisins and bourbon in a large mixing bowl. Cover tightly and let stand in refrigerator overnight. Heat oven to 275 deg. F. Grease 6-8-10 inch round layer pan; line bottom of pan with wax paper. Grease and lightly flour wax paper — combine ½ cup flour with pecans. In a large bowl sift the remaining flour with baking powder, salt and nutmeg. Place butter in a large bowl of an electric mixer and beat at medium speed until light and fluffy. Add sugar gradually, beating at medium speed until light and fluffy. Add egg yolks, beating until well blended, scrape sides of bowl with rubber spatula. Add 2 cups of sifted dry ingredients to the creamed mixture and mix thoroughly. Drain remaining bourbon from fruit. Add it and remaining dry ingredients alternately ending with dry ingredients. Beat after each addition, scraping sides of bowl often. Beat egg whites stiff but not dry, fold gently into cake batter. Add drained fruit and floured pecans to the batter, blend thoroughly. Pour cake batter into pans — allow 2 cups for 6 inch layer, 5 cups for 8 inch layer, 7 cups for 10 inch layer. Bake 6 inch layer 1 hour and 25 minutes, 8 inch layer 1 hour and 40 minutes and 10 inch layer 1 hour and 40 minutes or until cake tester inserted comes out clean. Cool cakes in pan on a wire rack for 10 minutes. Remove cake from pans onto racks and peel off wax paper. Cool completely. Wrap cakes in cheesecloth saturated with bourbon and then wrap in plastic wrap. Store in tightly covered containers in refrigerator for several weeks.

Unwrap cake and frost layers with:

¾ cup light corn syrup
¾ cup sugar
3 egg whites at room temperature
few grains of salt
¼ tsp. cream of tartar
1 tsp. vanilla extract

Combine sugar and syrup in a small saucepan. Cook over moderate heat (about 250 deg. F.) stirring constantly, until sugar dissolves and bubbles appear around edge of pan. Remove from heat. Place egg whites, salt, cream of tartar in a small bowl, beat with rotary beater or electric mixer set on high speed until almost stiff. Gradually pour in hot syrup in a thin stream, beating constantly. Add vanilla and beat 3-5 minutes, until frosting stands in stiff peak and appears less shiny.

Some more kitchen-tested recipes from Marge and Chuck Chandler. He is BofRS vice president at Eddyville, KY.

Bi-Centennial American Beauty Cake

2 ounces red food coloring
½ cup Crisco
2 eggs
3 tbsps. Nestles everready cocoa

1½ cups sugar
1 cup buttermilk
½ tsp. salt
1 tsp. vanilla
2½ cups sifted cake flour
1 tbsp. white vinegar (5%)
1 tsp. soda

Mix the food coloring and cocoa in glass bowl and let stand. Cream shortening and sugar well, add eggs and food coloring mixture and mix and beat well. Add buttermilk, cake flour, salt and vanilla and again, mix and beat well. Mix soda and vinegar, by hand. Pour into 2 greased and floured pans and bake in pre-heated oven at 250 deg. F. for 30 to 35 minutes or longer. Cool and remove from pans and cut each layer in half, making 4 layers.

Bi-Centennial American Beauty Cake Frosting

6 tbsps. flour
1½ cups sugar
3 tbsps. vanilla
1½ cups milk
1½ sticks butter
1 tsp. salt
¾ cups Crisco

Mix flour with milk and cook until thick (over very low heat) (thick as cream). Remove from heat and let cool. Mix butter and Crisco and beat 4 actual minutes timed. Add cooled flour and milk mixture and beat 4 actual timed minutes. Add vanilla and beat 4 timed minutes. NOTE: BE SURE TO MIX AND BEAT THIS FROSTING AS DIRECTED AND FOR THE ACTUAL TIME STATED.

Persimmon Pudding

1 cup sugar
1 stick butter
2 eggs well beaten
¼ tsp. cinnamon
1 tsp. allspice
2 cups milk
2 cups persimmon pulp, uncooked. Field or domestic persimmon.
⅓ cup tart jelly (use only if desired — we prefer it without)
¼ tsp. salt
1 tsp. soda
2 cups flour

Mix the ingredients as listed above in order listed and pour into an oblong pan. Bake 40 to 50 minutes at 350 deg. F. or until the top begins to crack open. Serve hot or cold with whipped cream or vanilla ice cream. DIFFERENT AND DELICIOUS.

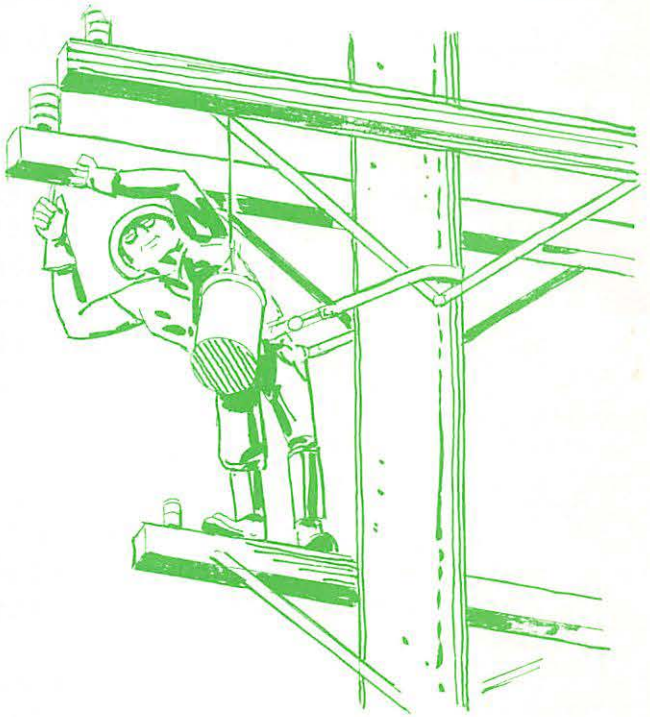
Zider Zee Pie

1 tsp. cinnamon
1 stick melted butter
¾ cups sugar
1 pkg. Holland Rusk Toast

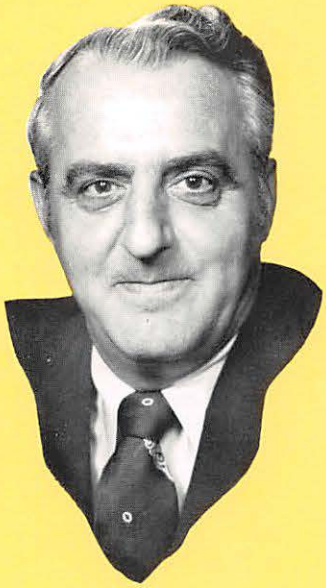
Roll the toast until slightly fine and add cinnamon, sugar and melted butter and form in pie pan to make the pie shell. Set aside. Save ½ cup of toast and sprinkle half the toast over the filling.

Zider Zee Filling
2½ tbsps. flour
2 cups milk
3 egg yolks
1 tsp vanilla

Mix the filling ingredients and mix well and cook slowly until thick. When thick, pour in pie shell. Beat the 3 eggs stiff with 3 tbsps. of sugar and spread over the filling. Sprinkle remaining toast over the egg whites. Bake in 425 deg. F. oven until egg whites are the browness that is desired. RICH ENOUGH TO MAKE YOUR TEETH FALL OUT.



Signalman Sam says: After a hard day's work, I like to come home and eat some good desserts and buns made from these recipes. They're kitchen tested by signalmen's wives. Try them, you'll find they're good eating. If you have a favorite recipe, send it to the Editor of the Signalman's Journal for use in "Food for Signalmen."



Bates' Commentary

At the time this commentary is being prepared, the gas shortage in the State of California has reached the crisis stage, and the Governor has invoked a form of rationing in an effort to ease the crisis. Headlines tell us that the entire United States can expect to be in like circumstances before the summer is over.

At this same time the railroad industry is suffering a crisis, wherein a midwestern bankrupt railroad has taken steps to embargo all traffic on more than 50% of its trackage. Courts have ordered that the embargo be delayed until May 31, and hearings are being held to determine ways to provide service to shippers at locations where the Milwaukee Road Trustee has proposed discontinuance of operation.

In my judgment the two crises are not unrelated. On the one hand the American public is being forced to alter their life style due to a shortage of fossil fuel. At the same time, truck traffic on our freeways continues unabated and airlines are operating at full capacity. Each of these forms of transportation is subsidized by government funds in operation of highways and airways, and are far less fuel efficient than railroad operations. On the other hand, due to a shortage of operating funds, a railroad is forced to embargo traffic and plans are being made to eventually abandon a large part of that railroad trackage.

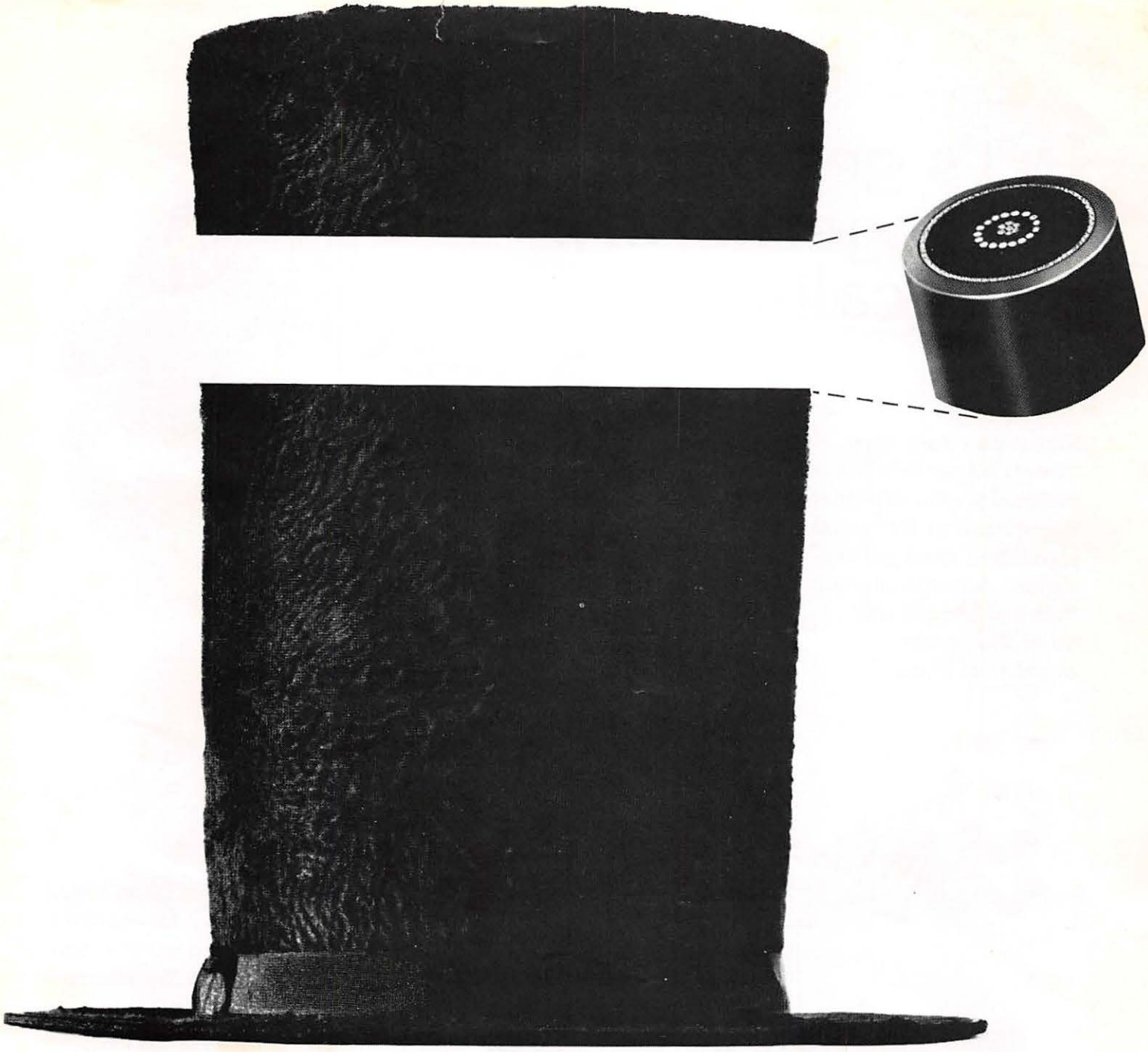
We are told, and I firmly believe that a reduction in the amount of oil used by this country must be immediate, and that in the foreseeable future, use of fossil fuel will have to be terminated completely.

Since we are being forced to alter our lifestyles because of the oil shortage, it seems to me that the American public could survive a large reduction in the number of trucks filling up the taxpayers' highways, and the number of airplanes used for passenger and freight transportation.

Contrary to statements made by some public officials, rail transportation continues to be the most fuel efficient of all modes of travel.

The dismantling of portions of our railroad system in this country makes no sense at all, when we consider the future transportation needs.

Tom Bates



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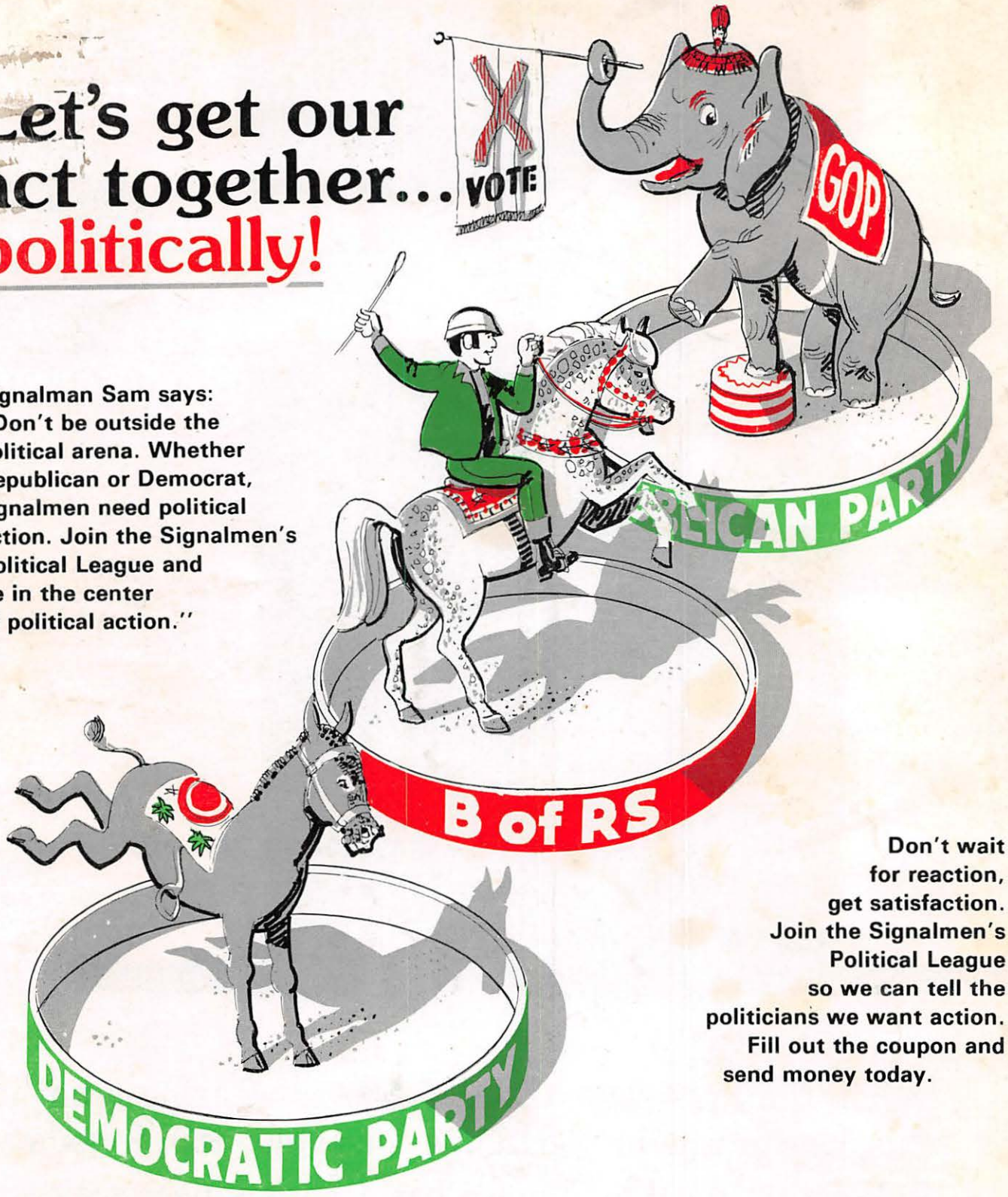

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